

Annex

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Surgery, Clinical
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PRACTICAL OBSERVATIONS
IN
SURGERY,

ILLUSTRATED WITH
CASES AND PLATES.

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AND SENIOR SURGEON OF THE GENERAL INFIRMARY AT LEEDS.

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1805.



1800

Deary, Clon.

PREFACE.



SOON after I had entered upon the Medical Profession, I began the custom of committing to paper such cases, which occurred in my practice, as seemed rare, or peculiarly instructive; hoping that the perusal of them might assist me in the discrimination and cure of diseases.

The following *Practical Observations* are chiefly drawn from these records. I have selected such as appeared to me the most useful, and such as, I hope, are not altogether unworthy the public notice.

The reader will not find in the following pages many excursions of fancy, or much theoretical rea-

soning : he must be content with plain facts, recited in a plain manner.

The papers have been drawn up amidst frequent interruptions, and sometimes at considerable intervals. I have laboured to be perspicuous ; though I have often found it difficult to describe a disease, or an operation, in a manner that should clearly convey my meaning.

Where I have happened to differ in opinion from the authors whom I have quoted, I have endeavoured to express my opinion in terms that should give no offence. I have aimed only at truth and utility.

The advantages of writing histories of diseases, while they are present to our view, are so great, that I would strongly recommend the practice to all who are engaged in the medical profession, but especially to young practitioners. The perusal of cases written by one's self is attended with this advantage, that the sense of the author is always understood ; and my own experience leads me to observe, that useful deductions may be drawn from faithful histories, many years after they were written, which did not occur at the time of writing.

Somes cases which I had written, have been suppressed, as the subjects of them have been anticipated by other writers. One disease which I have described, and to which I have ventured to give a name, had not been noticed by any author, with whose works I was acquainted, when I had nearly finished my paper on that subject. I find, however, that one form of it has been observed by Mr. Burns, of Glasgow, who has given a description of it, under the title of *spongoid inflammation*. Our conjoined accounts, will, I hope, throw considerable light upon the subject.

It will afford me pleasure if the following sheets should be the means of alleviating, in any degree, the distresses of the afflicted.

The following is a list of the names of the
 persons who have been appointed to the
 various offices of the Society for the
 year 1801. The names are arranged
 in alphabetical order, and the offices
 are given in the margin. The names
 are as follows:

The President, Mr. John A. Smith
 The Vice President, Mr. John B. Jones
 The Secretary, Mr. John C. Brown
 The Treasurer, Mr. John D. White
 The Librarian, Mr. John E. Green
 The Corresponding Secretary, Mr. John F. Black
 The Recording Secretary, Mr. John G. Grey
 The Executive Committee, Mr. John H. Blue
 The Finance Committee, Mr. John I. Red
 The Education Committee, Mr. John K. Yellow
 The Foreign Missions Committee, Mr. John L. Purple
 The Domestic Missions Committee, Mr. John M. Pink
 The Sabbath School Committee, Mr. John N. Brown
 The Sunday School Committee, Mr. John O. Green
 The Young Men's Society, Mr. John P. White
 The Young Women's Society, Mr. John Q. Black
 The Children's Society, Mr. John R. Grey
 The Bible Society, Mr. John S. Blue
 The Tract Society, Mr. John T. Red
 The Prayer Meeting, Mr. John U. Yellow
 The Fasting Meeting, Mr. John V. Purple
 The Anniversary Meeting, Mr. John W. Pink
 The General Meeting, Mr. John X. Brown
 The Special Meeting, Mr. John Y. Green
 The Extraordinary Meeting, Mr. John Z. White

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✎ Since the first chapter was printed off, I have used some saws made by an ingenious mechanic in Leeds, which worked with more ease than any I had used before. They were made very thin, and the teeth were a little *set off* like the teeth of common saws.

CHAPTER I.

ON FRACTURES OF THE SKULL.

IT must appear evident to every one, who considers the great advantages which we receive from those strong coverings with which our all-wise Creator has surrounded the brain, that no portion of them ought to be removed, in the treatment of injuries of the head from external violence, unless such removal is necessary for the cure of the patient.

That excellent surgeon, the late Mr. Pott, strenuously recommended the excision of a circular portion of the scalp, in all cases where the application of the trephine became necessary; and as the opinion of such an author must have great weight in settling the practice in these cases, I shall examine the grounds of this opinion, being persuaded that it is rarely, if ever, necessary to remove any portion of the scalp, while it remains in a sound state.

In Mr. Pott's Works* we find the following directions:
" If the integuments are not wounded, or if the wound
" made in them be so small as not to admit a proper
" examination of the bone, and the circumstances of the

* Vol. i. p. 157. oct. ed.

“case are such as render such inquiry necessary, a portion of the scalp should be removed. The manner of doing this has formerly been the occasion of much difference of opinion; but there can be no doubt about the greater propriety of removing a piece of the scalp for this purpose, by an incision in a circular form, it being that form which must afford the clearest view. If there be no wound, the point stricken should be made the centre of the incision; if there be a wound, such wound should be made the centre of the piece to be removed; and such piece should always be of size sufficient to render the application of the trephine easy.”

Let us now examine the practice here recommended. If the scalp is not wounded, or the wound is small, it is impossible to know the extent of the fracture, or the place where the trephine may be applied with the greatest advantage. Allowing therefore, for argument's sake, that it is necessary to remove a portion of the scalp for the purpose of applying the trephine; it is impossible to know, till the course and extent of the fracture have been ascertained, in what place this circular incision of the integuments is to be made. But when the extent of the fracture has been ascertained, by a simple incision of the integuments, made along the course of the fracture, the removal of a circular portion of the scalp becomes unnecessary. For if the fracture and consequent incision are extensive, a gentle separation of the divided parts will afford ample room for the application of the trephine. If the fracture is of small extent, a crucial division of the scalp will be sufficient for that purpose.

I have a farther objection to the method proposed by Mr. Pott. I consider it not only as unnecessary, but injurious. For, supposing a circular portion of the scalp to be removed where the trephine is applied, there will then remain nothing to cover the dura mater, when the wound is healed, but a tender cicatrix; whereas, if the integuments (except the pericranium) had been preserved whole in that part, they would in some measure have supplied the loss of bone, and would have afforded in future a con-

siderable degree of protection to the brain, which by the removal of the cranium is unavoidably exposed to danger.

I consider the preservation of the scalp as a material advantage to a patient who has suffered a fracture of the skull; not only with relation to the benefit which that natural covering of the brain may afterwards afford him, but also with relation to the effect which such preservation has in expediting the cure. In many cases, the scalp may be applied immediately to the cranium and dura mater, after the removal of such part of the bone as is necessary to be removed: and where the immediate application is improper, the scalp may be kept separate for a time, without injury to the patient, till the parts underneath it are brought into such a state as will admit a re-union.

If the excision of a portion of the scalp be considered as necessary, when a single application of the trephine is to be made; for the same reason such excision must be repeated, or enlarged, when the extent of the fracture requires a repeated application of that instrument. It is easy to conceive what a devastation of the scalp must be made in a very extensive fracture, by a surgeon who conducts himself agreeably to this doctrine. The late Mr. Gooch, who was an excellent surgeon, applied the trephine thirteen times in one case, and for that purpose removed the whole portion of scalp covering the fractured part of the cranium. An inspection of the Plate, in which this fracture is represented, is sufficient to convince any experienced surgeon how tedious the cure must have been, and how greatly the patient would have been benefited by the preservation of the scalp, if such preservation had been practicable.

It is well known by every experienced surgeon, that the existence of a fracture cannot always be ascertained till the cranium is exposed to view. Suppose then a surgeon called to a patient labouring under the usual symptoms of a fracture of the skull, where there is no wound, nor inequality in the surface of the cranium, to be perceived; how is he to act in such a case? According to the direc-

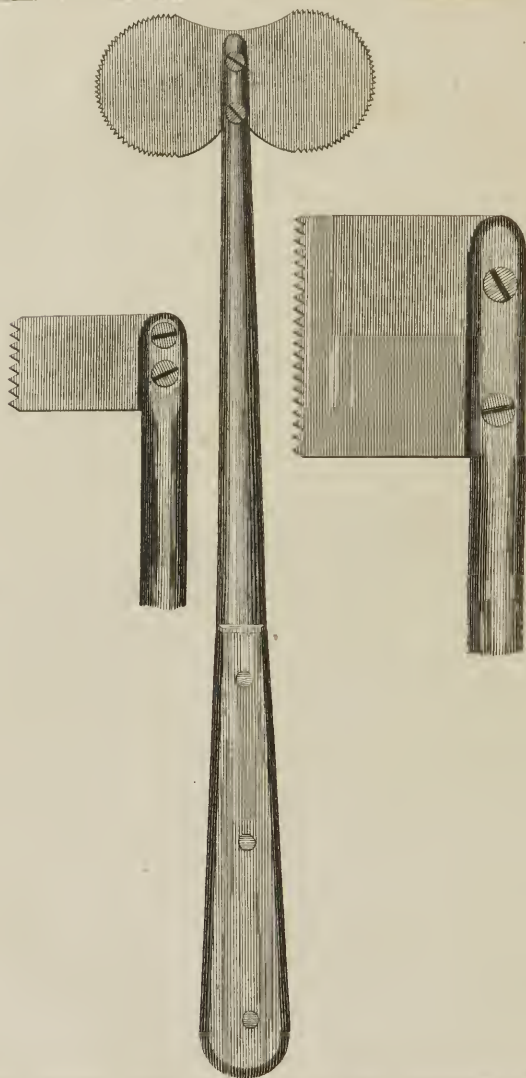
tions given by Mr. Pott, it seems that he ought to make a circular excision of the scalp, where the injury has been received, for the purpose of ascertaining the existence of a fracture. "If there be no wound, the point stricken should be made the centre of the incision." I am certain, however, that the surgeon whose practice is conformable to this direction, must not unfrequently have reason to censure the temerity of his own conduct, in depriving a patient, without necessity, of a portion of scalp, where a simple incision only was needful.

I had occasion, when I was a young man, to witness an error of this kind in a surgeon whose abilities I respected. A circular portion of the scalp was removed, under the expectation of finding a fracture of the cranium, to the mutual regret of the surgeon and patient, as a tedious dressing of an unnecessary wound was the consequence. This circumstance struck me forcibly, and led me to use great caution in removing any portion of the scalp without an indubitable necessity.

If an unnecessary removal of the scalp ought to be avoided in the treatment of fractures of the skull, it is of still greater importance to preserve every portion of the cranium, which the safety of the patient does not compel us to remove.

The only instrument now in general use, for sawing out any portion of the cranium, is the trephine, or trepan. I speak of these as one, as they differ only in the manner of working. The use of this instrument causes an unnecessary destruction of the cranium, and in other respects is attended with inconvenience. The piece of bone sawed out by the trephine must be of one figure, whatever be the form of the fracture; and the quantity of bone removed must be generally greater (sometimes considerably greater) than the case requires.

The purposes for which any portion of the cranium is removed are, to enable the surgeon to extract broken fragments of bone, to elevate what is depressed, and to afford



Engraved for J. Humphreys.

Edinburg.

a proper issue to blood or matter that is, or may be, confined. I will consider each of these purposes with respect to the application of the trephine.

When a broken fragment of bone is driven beneath the sound contiguous part of the cranium, it frequently happens, that the extraction cannot be executed without removing some of the unbroken part, under which the fragment is depressed. This might generally be effected with very little loss of sound bone, if a narrow portion of that which lies over the broken fragment could be removed. But such a portion cannot be removed by the trephine. This instrument can only saw out a circular piece. And as, in executing this, the central pin of the saw must be placed upon the uninjured bone, it is evident, that a portion of the sound bone, greater than half the area of the trephine, must be removed at every operation. When the broken and depressed fragment is large, a repeated application of the trephine is often necessary, and a great destruction of sound bone must be the consequence.

When the injury consists merely of a fissure with depression, a small enlargement of the fissure would enable the surgeon to introduce the point of the elevator, so as to raise the depressed bone. But a small enlargement of the fissure cannot be made with the trephine. When it is necessary to apply the elevator to different parts of the depressed bone, a great deal of the sound cranium must be removed, where a very narrow aperture would have been sufficient.

The same reasoning will apply to the case of openings made for the purpose of giving a discharge to extravasated blood, or matter.

If a saw could be contrived, which might be worked with safety in a straight, or gently curvilinear direction, it would be a great acquisition to the practical surgeon. Such a saw I can now with confidence recommend, after a trial of twenty years, during which time I have rarely used the trephine in fractures of the skull. Its use has

been adopted by my colleagues at the General Infirmary in Leeds; and will be adopted, I should hope, by every surgeon who has once made trial of it.

It was first shewn to me by Mr. (now Dr.) Cockell, an ingenious practitioner at Pontefract, to whom the public is indebted for the discovery, or revival, of this excellent instrument. A saw, formed on the same principle, is represented in Scultetus's *Armamentarium Chirurgicum*; but I understood Dr. Cockell to say, that the instrument which he shewed me was of his own invention, and that he had used it with great advantage in extensive fractures of the skull. Dr. Cockell's saw had a semi-circular edge, as represented in the annexed Plate,* where the size of the figure is two-thirds of the real dimensions of the instrument. But the edge may be made straight (as is shewn in the plate), or of any degree of convexity which may be thought most useful. The straight edged saw executes its task with greater readiness; but the convex edge is necessary when the bone is to be sawed in a curvilinear direction.† It is also useful when the thickness of that part of the cranium which is to be sawed out is very unequal.

This instrument is worked with ease, if the pressure made upon it by the hand is light. It saves much time in cases of extensive fracture, where the repeated application of a trephine would have been needful; and it may be used with less danger of wounding the dura mater, if the same precautions are used, in examining from time to time the depth of the groove, as is necessary in the use of the trephine.

I shall not enter at large upon the treatment of injuries done to the head by external violence; but shall refer my

* Plate I.

† The saws here represented were made by Mr. Savigny, in London. Those with a straight edge are drawn the real size of the instrument, and were ordered by my colleagues at the General Infirmary, Messrs. Logan and Chorley. It has been suggested to me by an ingenious friend, that the edge of the saw ought to be somewhat thicker than the remaining part, that it may work more easily in the groove.

reader to the many excellent treatises and observations which have been already published on that subject. I shall only give a short sketch of my own practice, as far as relates to the preservation of the scalp and cranium.

When I am called to a patient labouring under the symptoms of a fractured skull, if I find no wound in the scalp, upon examining the head when shaved, I make an incision through the scalp in the part where a fracture is most to be suspected. If no fracture appears, I take so much blood from the divided arteries, as the state of the patient seems to require, and then unite the lips of the wound.

If the bone is fractured, I enlarge the wound by a simple incision along the course of the fracture, tracing the fissure, or fissures, through their whole extent, unless they are continued to the basis of the skull, or where their limits cannot be explored. I do this either by cutting carefully upon the fissure, if it is small; or, if it is wide, and the pericranium much separated, by placing the back of my knife upon the fissure, and slitting open the integuments, as the course of the fracture directs. Having thus exposed the whole extent of the fracture, avoiding all unnecessary detaching of the pericranium; and having observed what is necessary to be done, for removing broken fragments, raising depressed bone, or giving issue to confined matter; I saw off such pieces of the cranium as require to be removed, while the integuments are held back by the assistants.

The line, in which the saw is to be moved, is first marked out by drawing it gently along the bone in the proper direction; or the surgeon may fix the course of the groove, by placing the nail of his thumb or fingers upon the cranium, as a guide to the saw. It happens not unfrequently that the fissure itself may be made the groove in which the saw is worked; and in this case no more bone is removed than that which the injury done to the head has rendered useless, as in the following case :

CASE I.

In 1781, a son of Mr. Christopher Topham, of Leeds, aged fourteen years, received a blow upon his head, from a piece of brick thrown at him. He vomited frequently on the two first days after the accident, and then retained his food. His parents, not apprehensive of the real nature of the injury, did not send for me till the fourth day after the accident. He had then a considerable degree of fever, but was still able to walk about his room, though some portions of the brain were lying amongst the hair.

Upon examination, I found a fracture of the right parietal bone, of an oval figure, two inches and a quarter in length, and an inch and a half at its greatest breadth. To this extent the bone was depressed, but not separated from the contiguous part of the cranium. Near the middle of the fractured part, where the depression was the greatest, there was a hole, and there the broken edges of the bone had pierced the dura mater, and wounded the brain. The bone was not depressed beyond the extent of the fracture. With the convex-edged saw I took out the depressed bone, by making the exterior fissure to be the groove in which the saw was worked, without the loss of any portion of uninjured bone, except a very small part at each extremity of the fracture, where it was necessary to bring the grooves to a point*. The removal of the depressed bone in this case would probably have required the application of a trephine at four places.

The superiority of an instrument, which will enable the surgeon to remove such a piece of bone, without any other loss to the patient, than of the part rendered useless by the injury, must be obvious to every one. The time taken up by the operation was also considerably shortened, and less danger of wounding the dura mater was, in my opinion, incurred.

* See Plate II. Fig. 1.

A fungus, about the size of a large nutmeg, arose from the brain, and had a strong pulsation. I made no pressure on the fungus, but only applied mild dressings, generally dry lint. At the end of three weeks the fungus was reduced nearly to a level with the rest of the wound, which then healed speedily.

In extensive fractures, where a long portion of bone is depressed, the advantages arising from the use of this instrument require no laboured comment. The following case will make them sufficiently manifest.

CASE II.

In 1784, I was sent for to Garforth, a village about seven miles from Leeds, to the son of a collier, aged thirteen years, who had suffered a fracture of the skull from the fall of a coal in the shaft of a coal-pit. The boy had vomited frequently, but continued sensible. There was a contused wound on the left side of his head, about three inches in length. I enlarged this wound, and traced the fracture through its whole extent. It began in the frontal bone, a little above the temporal muscle; crossed the coronal suture at right angles, running obliquely backwards and downwards, across the left parietal bone, to the occipital suture a little above the mastoid process. On the anterior part of the parietal bone the fracture was broad, and several broken pieces were depressed. In the remaining part, the fissure was wide; but the cranium remained at its due level. In my notes, made during my attendance on this patient, I find it remarked, that it would have required eight or nine perforations of the trephine, in order to remove the depressed pieces, and enlarge the fissure; whereas, I was able to take out all the depressed pieces without applying the saw beyond the breadth of the fracture, except where I thought it proper to enlarge the fissure a little; and this was effected by a longitudinal division of the bone on one side of the fissure.

The dura mater was found covered with coagulated blood where the bone was broken into fragments. Beneath the posterior part of the fracture, where there was merely a gaping fissure, without depression of the cranium, I found a lacerated wound of the dura mater, two inches in length.

I did not remove any portion of scalp in this operation.

An oblong fungus arose through the aperture in the dura mater; but with simple dressings, without pressure, the fungus retired as the cicatrization advanced, and the boy got well, without having lost any portion of the scalp, or any part of the cranium, except the broken fragments, and a narrow strip of bone which lay over the wound of the dura mater.

My usual method of dressing after the operation, has been, to cover the dura mater with lint, and to lay down the flap of scalp upon the lint, till granulations have arisen from the dura mater, and filled up the cavity made by the loss of bone. I have then placed the flap in immediate contact with the inferior granulations, and supporting it with plasters, have thereby promoted a speedy union of the parts. But since Mr. Mynors of Birmingham, published a case, in which he laid down the scalp upon the dura mater, without any intervening dressings, I have several times, in favourable cases, followed this method with advantage, and have even united the divided integuments by stitches of the interrupted suture. But this method is not proper in all cases. Where the dura mater is lacerated, and portions of the brain are coming away, it must evidently do mischief. So also in fractures, where the termination cannot be ascertained, I should decline such a practice.

When I have attempted to bring about the adhesive process in the first instance, I have not been able to prevent some degree of suppuration, but if the wound had a depending orifice, the matter escaped between the stitches, and the divided scalp healed with a very narrow cicatrix.

When the orifice of the wound has not been favourable for the issue of the purulent matter, an abscess has sometimes formed near the fracture, and has required an incision of the integuments. But this is a much less inconvenience than that of leaving the dura mater uncovered by the scalp, when it had lost its natural covering of bone. Most of the cases, in which I have used Mr. Mynors's method, have been fractures of the os frontis.

The following case affords an instance of the safety and advantage of this method.

CASE III.

August 9th, 1800, I was called to the son of Thomas Wood of Birstal, aged ten years, who, by falling into a stone quarry the preceding evening, had fractured his skull. He had remained insensible since the accident.

There were two transverse fissures in the upper part of the os frontis, on the left side. One of them was between two and three inches in length; the other was shorter. Just above these fissures, the bone was depressed transversely about two inches, as if it had been struck with the edge of a stone. The bone was not broken where it was depressed, but was driven inwards, so as to form at the bottom a narrow furrow, or groove. With the straight-edged saw I cut through the bone at the bottom of the furrow, and also at the lowest fissure. I took away the intermediate bone, and then raised that portion of the cranium, above the furrow, which yet remained depressed. The dura mater was not injured. I drew together the integuments, and united them by the interrupted suture.

The boy was delirious and restless, frequently shouting during the operation. He had been bled by Mr. Booth, the surgeon who was attending him. I directed a purgative to be given, and the saline draughts after its operation. I advised the application of a blister to his head,

with bleeding by leeches, if the delirium should continue.*

11th. He was much better, but had not regained his understanding completely. He was more calm, and could give a rational answer sometimes to the inquiries made of him.

I did not visit him again, but was informed by his surgeon, that he soon regained his understanding, and was able on the 10th day after the operation to walk from his father's house, which was a public one, to that of a neighbour, to avoid the noise of a large company.

The wound was healed on the 26th day after the operation.

Fig. 1. in Plate II. represents that portion of the parietal bone, which was removed by the circular saw, in the first of the preceding cases. This fractured portion was considerably depressed from its circumference, where it remained attached to the sound part of the parietal bone. It was fissured also in various directions, and had a hole formed in it near its middle, where the letter *a* is placed. Before the drawing was taken (which is a mere outline), the bone was reduced to a flat state by pressure. An inspection of the figure will sufficiently demonstrate the great advantage of an instrument, which could remove such a broken piece of bone, still adhering firmly at its circumference to the sound part, without any loss of sound bone, except a very small part at each extremity of the fractured portion. As it was necessary to bring the grooves, in which the saw moved, to a point, at each extremity of the fractured portion, the loss of a minute quantity of sound bone was unavoidable; but this was trifling, compared with the quantity destroyed at every operation, by the use of the trephine.

Fig. 2. Represents the edge of a portion of the os occipitis, which it was necessary to remove in an extensive

* These means were not used.

Fig 1.

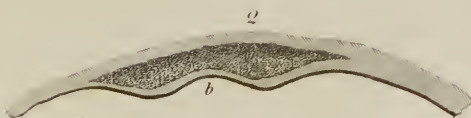


Fig 2 b that part of the bone which covers the lateral sinus



fracture of that bone, that passed across one of the lateral sinuses.

Not to enlarge at present upon the impossibility of removing so long a piece of bone with the trephine, without destroying a great deal of sound cranium, by the frequent application of that instrument, I shall only remark, that the annexed figure shews, how difficult it would have been to saw out so unequal a piece of bone with the trephine, without injuring the dura mater. By means of the saws above represented, I took out this piece without the least injury to the lateral sinus. I used the straight saws till I had got through the thinner parts of the bone, and then divided the thick parts by means of the convex-edged saw, which will safely divide a narrow ridge of bone, as it does but touch the part with two or three teeth at once.

Though this instrument is principally useful in fractures of the skull, yet its use is not confined to such cases. It may be applied for the removal of bone under such circumstances as will not admit the use of a common saw. I found it to be a convenient instrument in one of the following cases of caries in the tibia, and have annexed two figures of the piece of bone, which it enabled me to remove, for the purpose of exploring a deep seated caries in the tibia of a young lady, whose case I shall relate.

Fig. 3, and 4, give an exterior and interior view of the wedge of bone, which was sawed out of the tibia of the young lady, whose case is related in the next article.

ABSCESS IN THE TIBIA WITH CARIES.

CASE I.

TOWARDS the conclusion of the year 1786, a young lady from Richmond, in Yorkshire, consulted me, on account of a small tumour in the anterior and middle part of the tibia. It had exactly the appearance of a common node; and had such a degree of softness in its centre, that I apprehended a small quantity of fluid was contained in it; though that could not, from the thickness of the periosteum, be distinctly felt. The account which she gave me of her disorder was as follows:

In the preceding May she had a fever, which continued about four weeks; at the expiration of which, a violent pain began to affect her leg. The pain continued without intermission during six weeks, and then abated upon the appearance of a small tumour on the shin. She could then walk about with little or no uneasiness: but sneezing or coughing caused a painful sensation in the tumour. She was, in other respects, in perfect health.

I recommended the trial of some means to effect the dispersion of the tumour; and with this view I directed Plummer's pill, with the decoction of mezereon, and applied mercurial ointment to the part, covering the tumour, in the intervals of this application, with ceratum saponis. By the use of these means the tumour became less, and the uneasiness was diminished; so that the young lady thought herself nearly well. But before the expiration of winter the tumour began again to increase in bulk; and in the summer 1787, she returned to Leeds to put herself intirely under my care.

The tumour was then larger and softer, and there remained not the least hope of curing my patient without discharging the matter, and afterwards treating the case as the state of the periosteum and tibia might require.

Upon laying open the tumour, I found the periosteum diseased, and thickened; separated from the tibia, and including a small quantity of purulent matter. The surface of the tibia was rough, as far as the matter had covered it; and in the centre of the rough part there was a hole equal in bore to a goose's quill, which penetrated the bone in a direct line about a quarter of an inch.

As the bone was firm in the rough part, and resisted the pressure of a probe, I thought it right to try whether the surface, upon exposure to the air, would not produce good granulations; and, therefore, after removing so much of the periosteum as I found in a morbid state, I dressed the wound simply.

Upon continuing this treatment about a fortnight, I became sensible, that more matter issued from the wound than the surface of it ought to have produced. Suspecting that the hole above mentioned might lead to some cavity in the bone, I plugged it up with lint, and found, on removing the plug the next day, that more purulent matter flowed out than the perpendicular cavity of the bone could contain. I made an examination with a bent probe, and discovered a horizontal cavity connected with the perpendicular one, and running both upwards and downwards in the longitudinal direction of the bone. It was now clear that the bone was affected with an internal caries; but it was impossible to ascertain the extent of the caries by such an examination.

Nothing now remained to be done, which could afford a rational hope of curing this disease, except amputation of the limb, or a bold attempt to explore fully the extent of the internal caries, and to remove the diseased part of the bone. I explained the case fully to my patient, who sub-

mitted intirely to my judgment the means to be used for her recovery. She had apparently a good constitution; and, excepting the caries of the bone, was in perfect health. I determined therefore to avoid, if it were possible, disfiguring this young lady by an amputation. I was satisfied that she would not reproach me on account of my ineffectual endeavours to preserve her limb, if my attempt to remove the diseased part of the bone should prove unsuccessful.

I began the operation by dissecting off the granulations of flesh which had arisen from the bone, and then sawed out, by means of a circular headed saw, a wedge of the tibia two inches in length, which I had previously marked at each extremity of the longitudinal cavity in the bone. This wedge was half an inch in breadth, and a quarter of an inch in thickness, and consisted intirely of the laminated part of the bone. The removal of this portion of the tibia brought to view a caries of the cancelli almost as extensive as the length of the piece which I had sawed out. With different trephines, suited to the breadth of the caries, I removed the diseased cancelli of the bone quite through to the opposite lamella, as this part of the bone was carious throughout its whole thickness.

As the caries extended itself in various directions, it was not possible to remove the whole of it with a trephine, without removing also a large portion of the sound part of the bone. But this I wished to avoid as much as possible. By the assistance therefore of a strong sharp pointed knife, I pursued the caries in every direction, until I had removed every part which had an unsound appearance.

This operation took up more than two hours; yet the young lady bore it with the utmost patience and fortitude. I dressed the cavity in the bone, and the rest of the wound, with dry lint, in the most simple manner. The whole surface was speedily filled with good granulations, and a complete cure was obtained without any exfoliation.

The limb which was diseased has now as much strength as the other; and no uneasiness is produced even by violent exercise.

REMARKS.

Upon a review of this case, I am inclined to think, that an abscess was formed within the tibia in consequence of the fever which she had in May 1786. During the continuance of the fever, she had no particular pain in her leg; but upon the decline of the fever the pain commenced, and continued violent for six weeks. It seems most probable, that during this time the matter was making its way through the anterior lamella of the tibia, and that the pain abated soon after the matter had perforated the bone; for it ceased immediately upon the appearance of a tumour on the shin. It is surprising that such a perforation should have been made through so firm a part of the bone, without any extensive caries in the lamella; especially as the lamellated part of the tibia was remarkably firm and thick. The perforation appeared as if it had been made with a gimlet. The pain was so great during this operation of nature, that my patient assured me, and that immediately after the removal of the carious part of the bone, that she had suffered more pain during the whole of the six weeks above mentioned, unless when she was asleep, than I had caused during the operation necessary for removing the unsound bone.

CASE II.

Hannah Croft, a stout young woman, aged fifteen, was admitted an in-patient of the General Infirmary at Leeds, in the beginning of the year 1792. She had a scabby eruption on one of her hips, and a small ulcer in the leg. As the ulcer shewed no granulations of flesh, yet discharged daily a quantity of purulent matter, I examined it with a probe, and found that the bone was carious beneath. Upon pressing the integuments, which surrounded the ulcer, against the tibia, I could distinctly feel a roughness

in the bone, extending to the breadth of a shilling, with a depression in the middle of the rough part. I divided the integuments as far as this roughness extended, and found a circular portion of the tibia to be carious, and to have a hole in the middle of it, out of which issued purulent matter. The patient had felt very little pain in her leg previously to her admission into the Infirmary; and when first admitted took little notice of the ulcer in her leg.

I thought it advisable to treat this patient in the manner which had proved so successful in the preceding case; and, having divided the integuments upwards and downwards, until the whole of the caries was exposed, I proceeded to remove the diseased parts of the bone.

I first took away the central part, where the abscess was formed in the tibia, by the help of a trephine. The lamellated part of the bone, surrounding the hole out of which the matter chiefly issued, was in this case carious; but the disease did not run deep into the cancelli of the bone. Above and below this central part, the caries seemed to be intirely confined to the lamella, and extended, in the whole, about six inches. After sawing out, with the trephine, the part principally affected; I removed the rest of the caries with sharp gouges, cutting off every portion of bone which had a morbid appearance.

The operation was tedious, but amply repaid my patient for the pain which it gave her, by the preservation of her limb. The diseased parts of the bone were so completely removed, that there was not the least exfoliation during the progress of the cure; and the wound was intirely cicatrized at the expiration of ten weeks.

Messrs. Lucas and Logan attended, and gave me their assistance at the operation.

I have treated some other cases of caries in the tibia in the same manner, and with equal success. Where the extent of the caries is not so great as to prevent a complete removal of the morbid part, this method is extremely useful, and far superior to the use of the potential or actual cautery.

The trephine is not wanted where the cancelli of the bone are not affected with the caries. The diseased parts of the lamella may be removed with gouges, or small chissels. Granulations of flesh will then arise from the sound parts of the bone, and become united with the integuments, which ought to be preserved as far as is possible.



A WOUND OF THE POSTERIOR TIBIAL ARTERY.

As the saws above described were found to be extremely useful in this case, and as the operation, by which the cure was effected without amputation of the limb, was never before performed within the compass of my knowledge, I shall relate the particulars of the case, though the patient did not come immediately under my own care.

June 22d, 1801. John Appleyard, a collier, aged fifty-four years, was admitted an in-patient of the Leeds Infirmary, under the care of Mr. Logan, on account of a wound in his leg, made with a sharp pick-ax, the 15th instant. The wound had bled violently at the first, but the hæmorrhage ceased in a short time, and did not return till near the expiration of a week. Mr. Logan was then desired to visit the poor man at his own house; but the hæmorrhage, though it had been again violent, had ceased before his arrival.

Mr. Logan, finding that the pick-ax had passed into the man's leg between the tibia and fibula, and had made a deep wound, in which, without dilatation, the bleeding

vessel could not be discovered, recommended a removal of the patient to the General Infirmary.

24th. I saw the patient with Mr. Logan. The wound was then plugged up by pieces of sponge, which the house apothecary had applied, upon an appearance of returning hæmorrhage. There was at this time no bleeding; and the leg being in an inflamed state, we judged it best to apply a mild poultice, and to defer an enlargement of the wound till the inflammation should have ceased.

July 1st. The hæmorrhage returned, but was immediately checked by the application of a tourniquet. Mr. Logan called a consultation of the surgeons, and as the inflammation of the leg had now ceased, it was determined to make an attempt to secure the bleeding vessel. After the removal of the sponge, the wound was carefully examined. It admitted a finger to pass readily behind the fibula to the side of the tendo Achillis, at which place the wound approached near the skin. As it was impossible to discover the wounded vessel through the orifice at which the pick-ax had entered, it was thought proper to make a wound on the back part of the leg by the side of the tendo Achillis, where the integuments felt thin. Upon slackening the tourniquet, the blood gushed out at both the wounds, and appeared so clearly to flow from a vessel deeply seated behind the fibula, that there seemed to be no hope of discovering and securing the vessel by means of an incision made on either side of the fibula. In this dilemma it occurred to me, that the late Mr. Gooch had proposed the removal of a portion of the fibula, in such a case as the present, to prevent the necessity of amputating the limb. I mentioned this thought to my colleagues, who approved of the proposal, and the operation was immediately performed by Mr. Logan.

After making a proper division of the integuments, the peronæi muscles were separated from the bone sufficiently to admit of the removal of a piece two inches in length. It was impossible to perform this part of the operation with a common saw, without cutting through the peronæi

muscles. The use of a trephine would have left four sharp projecting points of bone, which would have required the assistance of the strong bone nippers. But the saws above described took off the bone without injury to any of the contiguous soft parts, and without leaving any projecting point of bone.

The removal of the bone gave us a complete view of the wounded artery, in which a hole had been made by the point of the pick-ax, at the distance of three inches above the joint of the ankle. The vessel was tied both above and below the orifice, and after the divided integuments were in part united by futures, the leg was placed in a fracture box.

The patient recovered without any bad symptom.

CHAPTER II.



ON THE CATARACT.

My original design in the following observations, was to lay before the reader such remarks on the practice of *couching*, as my own experience had enabled me to make; without entering upon a discussion of the comparative merits of that operation, and the more fashionable one of *extraétion*. But as Baron Wenzel has given, what I esteem to be, a very erroneous account of the disadvantages of the former operation; and as Mr. Ware, the translator of the Baron's work, appears to coincide with this author in his opinion on the subject; I have judged it necessary to make some remarks on the Baron's objections, and to compare the real disadvantages of the two methods of operating for the cure of the Cataract.

I had finished my observations before Sir James Earle's *Account of a New Mode of Operation* fell into my hands; and as I have had no opportunity of seeing Sir James's operation, or even his instrument, I shall make no reflections on his work, but sincerely wish, that his new mode may be found superior in utility to any that has been hitherto practised.

The term *Cataract*, when applied to the eye, is usually defined to be, *an opacity of the crystalline humour, or its capsule*. This definition gives a just idea of the nature of the disease, but leads to an incorrectness in language, when speaking on the subject. *Opacity*, being only a quality of the crystalline, cannot be depressed or extracted. It is the crystalline itself, or its capsule that is the subject of operation. We ought, therefore, to say, that the term

cataraet either expresses an opacity of the crystalline, or the crystalline itself in an opaque state. After this definition, we can speak with propriety of breaking, depressing, or extracting a cataract.

My own experience having led me to prefer the mode of depression, I shall lay before my reader such observations on that method of operating, as a practice of thirty-three years* has enabled me to make; and shall subjoin a few cases to illustrate these observations. These, I hope, will not be altogether useless to those practitioners who may choose to operate after this method, which appears to me to be both more easy, and more safe, than the common method of extraction.

Before I enter upon these observations, it may not be amiss to make a few anatomical remarks on the structure of the eye, as far as relates to the operation of *couching*. These are the more necessary, as some of the latest and best writers on the operation have delivered opinions, or directions, inconsistent with the structure of the eye.

A surgeon, who undertakes this operation, ought to have a clear idea of the structure and situation of the crystalline humour, and its capsule; of the iris; and also of the manner in which that part of the eye, called its *posterior chamber*, is formed.

The crystalline may be considered as consisting of two plano-convex lenses, of unequal bulk and convexity, joined together by their flat surfaces. The larger and more convex part of the crystalline lies sunk in a cavity formed in the anterior part of the vitreous humour; while the smaller and less convex portion projects a little before the anterior surface of that humour. That part of the crystalline, which may be considered as the place where these two unequal portions unite, lies contiguous to the brim of the cavity

* I entered upon the profession of Surgery in the year 1759, but did not begin to perform this operation till the year 1768. Since that time, the cases of Cataract which have come under my care have been somewhat numerous.

formed in the vitreous humour. From this brim goes off the capsule which covers the anterior part of the crystalline. And although the posterior portion of the crystalline is also enveloped by a capsule, yet it is this anterior covering chiefly, which, in speaking of the cataract, is denominated its *capsule*.

The crystalline humour is of firm consistence at its centre, but becomes gradually softer towards its circumference, where it approaches nearly to the state of a fluid. The centre of the crystalline is situated in its posterior portion.

That part of the iris which lies between the ciliary ligament and the crystalline, is covered on its posterior surface with thick projecting folds or plaits, called the *ciliary processes*. These processes adhere slightly to the anterior part of the vitreous humour, by the intervention of a black substance (immediately to be described) in their course from the ciliary ligament to the brim of that cavity in which the crystalline lies. At this brim they terminate, where they are attached to the circumference of the capsule of the crystalline. The remaining part of the iris lies loose before the crystalline, and at a very small distance from it; a minute quantity of the aqueous humour, which flows through the pupil, being only interposed between them.

The posterior surface of the iris, as well as the ciliary processes, is covered with a black substance, which, on account of the slimy state in which it is found after death, is usually called *pigmentum nigrum*. It might with greater propriety (as the late Dr. Hunter observed) be called *membrana nigra*, since it appears to constitute a fine membrane in the living subject. By this latter name I shall distinguish it, when I have occasion to mention it in the following observations.

The *posterior chamber* of the eye is that space, which lies between the iris and the capsule of the crystalline. As the ciliary processes adhere on all sides to the circumference of the capsule, the transverse diameter of the posterior chamber must be exactly equal to that of the crystalline. The distance between the iris and the crystalline must be

extremely small, for as the latter projects a little before the vitreous humour, and as the former is brought very near to that humour by the attachment of the ciliary processes, the iris and crystalline must be nearly in contact with each other. Indeed, they seem to be kept asunder merely by that minute quantity of the aqueous humour which flows through the pupil, and which serves to transmit to the exterior part of the crystalline the most oblique rays of light which can enter the pupil.

The crystalline humour is situated, not within, but behind, the posterior chamber of the eye. If it is moved directly upwards or downwards, its place in the vitreous humour will be changed; but it will not be brought into the posterior chamber. If it is moved directly forwards, it may be made to pass through the posterior chamber, and in this transit the different parts of it, in succession, will occupy the posterior chamber; but the whole of the crystalline can never lie in the posterior chamber. When the crystalline is moved horizontally forwards, by a needle introduced into the vitreous humour behind it, the iris does not advance sufficiently to permit the crystalline to remain between it and the anterior part of the vitreous humour; but the pupil becomes dilated, and the crystalline, as it advances, passes into the anterior chamber of the eye.

When authors speak of depressing the crystalline in the posterior chamber of the eye, they forget that the transverse diameter of the crystalline, and that of the posterior chamber, are the same; consequently, that it is impossible to depress the crystalline in the posterior chamber.*

* If all that part of the eye which lies behind the iris be called the *posterior chamber*, the cataract may then be said to be depressed in that chamber; but this is not the proper anatomical meaning of the term, which signifies, as Winslow has observed, a subdivision of that part of the eye occupied by the aqueous humour.

“On donne le nom de chambres de l’humeur aqueuse à ces deux espaces, et on les distingue par rapport à la situation, en chambre antérieure et en chambre postérieure.—La postérieure, qui est cachée entre l’uvée et le cristallin, est fort étroite,” &c.

When they speak of introducing a broad couching needle into the posterior chamber of the eye, they seem to forget that the iris and crystalline are nearly in contact with each other. If the cutting edges of the spear-shaped needle are placed horizontally in the posterior chamber, for the purpose of depressing the cataract, the anterior edge must wound the iris, unless it be placed directly opposite the pupil, where the iris is deficient.

The point of a needle, which has penetrated the coats of the eye behind the ciliary ligament, cannot be brought into the posterior chamber without passing through the crystalline. But it will become visible to the operator, even in a cataractous eye, before it has entirely passed through the crystalline: for that being generally rendered opaque only in its central part, the needle becomes visible as soon as it has passed this part, if the capsule remains transparent.

When the crystalline humour becomes opaque, the central part seems always to be the first affected. From the centre the opacity extends in all directions towards the circumference, but rarely, if ever, reaches the circumference. For if that were the case, unless the capsule contained a transparent fluid surrounding the crystalline, a mere opacity of this humour would be sometimes attended with total blindness, which, I believe, never happens without some other morbid affection of the eye. The ciliary processes advance on all sides as far as the circumference of the crystalline; therefore no rays of light can fall upon the retina without passing through the crystalline.

I cannot take upon me to say, whether there is or not, in the human eye during life, a minute portion of transparent fluid, surrounding the crystalline, and contained within its capsule, through which the most oblique rays of light may pass; but this consideration may be neglected, and we may speak of the crystalline as filling the capsule, without incurring any practical error.

In the operation of couching, the crystalline can only be moved into some part of the vitreous humour, different

from that in which it is naturally situated, unless it is brought into the anterior chamber. It cannot be lodged *beneath* the vitreous humour, as a valuable modern author speaks; for that humour is every where in contact with the retina, and fills up the cavity formed by the coats of the eye.

As the needle, which I now use in the operation of *couching*, differs somewhat from any that I have seen, and appears to me to possess some advantages over the spear-shaped needle, which is most commonly used; I have given a figure of it, both in its natural size, and also when magnified for the purpose of seeing its parts more distinctly.*

The length of the needle is somewhat less than an inch. It would be sufficiently long if it did not exceed seven-eighths of an inch. It is round, except near the point, where it is made flat by grinding two opposite sides. The flat part is ground gradually thinner to the extremity of the needle, which is semicircular, and ought to be made as sharp as a lancet. The flat part extends in length about an eighth of an inch, and its sides are parallel. From the place where the needle ceases to be flat, its diameter gradually increases towards the handle. The flat part is one-fortieth of an inch in diameter. The part which is nearest the handle is one-twentieth of an inch. The handle, which is three inches and a half in length, is made of light wood stained black. It is octagonal, and has a little ivory inlaid in the two sides which correspond with the edges of the needle.

The advantages which this instrument appears to me to possess, above the common spear-shaped needle, are these:

* In 1768, I had an opportunity of seeing several operations performed by Dr. Hilmer, an itinerant oculist. He made use of a small round needle, which appeared to me superior in point of safety to the common one, which is larger, and made with a spear-shaped extremity. I immediately adopted the form of his instrument, making such alterations in it afterwards, as I judged likely to increase its utility.

1. It is only half the length of the common needle, and this gives the operator a greater command over the motions of its point, in removing the crystalline from its bed, and tearing its capsule. It is also of some consequence, that the operator should know how far the point of his needle has penetrated the globe of the eye, before he has an opportunity of seeing it through the pupil; as it ought to be brought forwards when it has reached the axis of the pupil. Now he may undoubtedly form a better judgment respecting this circumstance, when the length of his needle does not much exceed the diameter of the eye, than when he uses one of the ordinary length, which is nearly two inches. The shortness of the needle is peculiarly useful, when the capsule is so opaque that the point cannot be seen through the pupil.

2. As this needle becomes gradually thicker towards the handle, it will remain fixed in that part of the sclerotic to which the operator has pushed it, while he employs its point in depressing and removing the cataract. But the spear-shaped needle, by making a wound larger in diameter than that part of the instrument which remains in the sclerotic, becomes unsteady, and is with difficulty prevented from sliding forwards against the ciliary processes, while the operator is giving it those motions which are necessary for depressing the cataract.

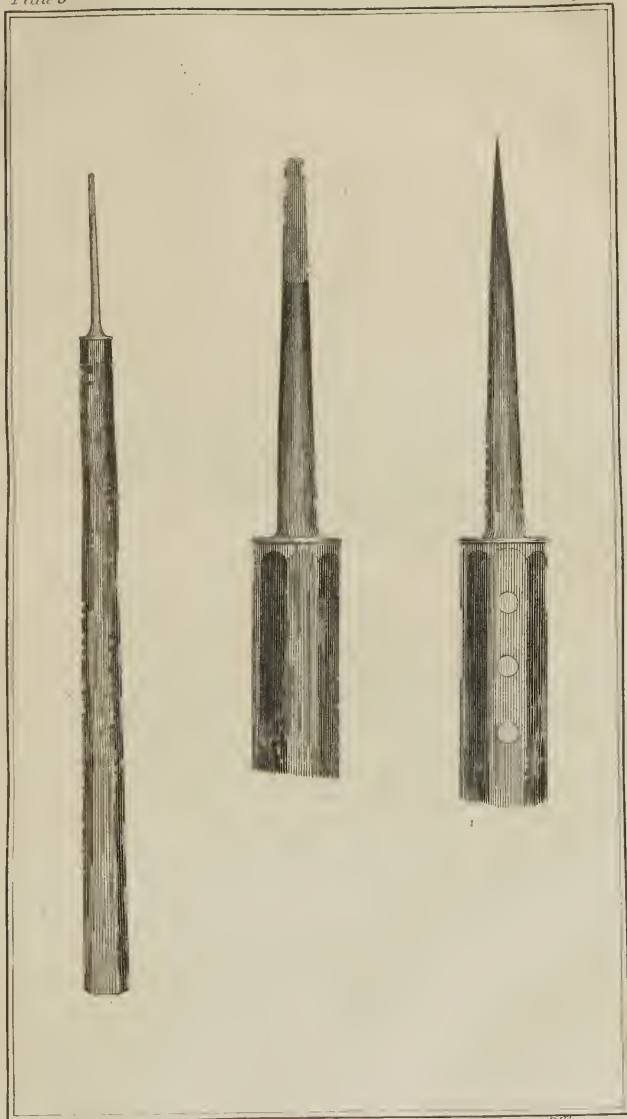
On the same account the common spear-shaped needle may suffer some of the vitreous humour to escape during the operation, whereby the iris and ciliary processes would be somewhat displaced, and rendered flaccid; whereas the needle which I use, making but a small aperture in the sclerotic, and filling up that aperture completely during the operation, no portion of the vitreous humour can flow out so as to render the iris and ciliary processes flaccid.

3. This needle has no projecting edges: but the spear-shaped needle, having two sharp edges, which grow gradually broader to a certain distance from its point, will be liable to wound the iris, if it be introduced too near the ciliary ligament with its edges in a horizontal position.

I have been informed, that, in an operation performed by one of the most eminent surgeons in the metropolis, now deceased, the iris was divided as far as the pupil. If the operator, in order to avoid this danger, introduces his needle with its edges in a vertical position, he will divide the fibres of the sclerotis transversely, and by thus enlarging the wound will increase the unsteadiness of the instrument. Besides, however the needle be introduced, one of its sharp edges must be turned towards the iris in the act of depressing the cataract; and, in the various motions which are often necessary in this operation, the ciliary processes are certainly exposed to more danger, than when a needle is used which has no projecting edge.

4. It has no projecting point. In the use of the spear-shaped needle, the operator's intention is to bring its broadest part over the centre of the crystalline. In attempting to do this, there is great danger of carrying the point beyond the circumference of the crystalline, and catching hold of the ciliary processes, or their investing membrane, the *membrana nigra*. This accident is the more probable, as the point of the needle must unavoidably be directed obliquely forwards, and this motion, if carried too far, brings the point into contact with the ciliary processes, as they surround the capsule of the crystalline.

A needle, made according to the figure given in the annexed plate, will pass through the sclerotis with ease. It will depress a firm cataract readily, and break down the texture of one that is soft. If the operator finds it of use to bring the point of the needle into the anterior chamber of the eye (which is often the case) he may do this with the greatest safety, for the edges of the needle will not wound the iris. In short, if the operator, in the use of this needle, does but attend properly to the motions of its point, he will do no unavoidable injury to the eye; and this caution becomes the less embarrassing, as the point does not project beyond that part of the needle



Engrav'd for J. Humphreys

Blanne. &c.

by which the depression is made, the extreme part of the needle being used for this purpose.

The appearance of a cataract has been so often described, that I shall not trouble my readers with a repetition of the description. A careful surgeon, who understands the anatomy of the eye, will not often mistake this disease. There is, however, one state of the eye, which may lead an experienced practitioner into doubt, or may even cause him, without the greatest circumspection, to form a wrong judgment. In some persons, that part of the eye which is seen through the pupil does not appear black as usual, but has a grey appearance, or is of a dark pearl colour. This is so like the appearance of an incipient cataract, that, if the sight of the person is diminished, a surgeon may be induced to form a wrong prognostic. The appearance which I have described occurs in one species of amaurosis, to which persons advanced in age are particularly subject. It occurs also in some middle aged persons whose sight is defective. In examining attentively the eyes of such persons, one may observe, that the part which puts on a greyish cast is situated at a greater distance behind the pupil than an incipient cataract, and that it has a more polished or shining appearance.

We have no certain criteria by which it can be known, previously to an operation, whether a cataract is soft or hard.* Those proposed for consideration by Mr. Pott † are not to be relied upon. Some of the most firm cataracts, which have occurred in my practice, were neither formed hastily, nor preceded by pain in the head. On the other hand, two cataracts, which came on the most rapidly of any that I have seen, and which seemed to have been formed almost instantaneously, were found to be soft. The subject, in one of these cases, was a married woman, who had enjoyed perfect sight until the time of her fifth labour. Immediately after her delivery she became sensible of a

* I have generally found a dark coloured cataract in old persons to be of a firm consistence.

† Pott's Chirurgical Works, vol. iii. p. 222.

considerable defect in her sight, and could afterwards discern no object distinctly. Soon after she had got abroad, her husband brought her to Leeds, and consulted me. I found a cataract formed in each eye, and, upon operating a short time afterwards, the cataracts were found to be uniformly soft.

When a cataract is complicated with a complete amaurosis, or a total opacity of the cornea, the removal of the diseased crystalline must be fruitless. But in partial affections of the eyes from these complaints, a patient may receive such a degree of sight from an operation as yields much comfort, though it falls short of distinct vision. An universal adhesion of the iris to the capsula of the crystalline argues such a morbid state of the eye, that an operation cannot be undertaken without considerable doubt respecting the event, though the operation is not hereby rendered wholly improper. In this case, the iris shews no motion upon a sudden exposure to light, the pupil usually remains contracted, and is often irregular in its form. I have repeatedly operated with success where the adhesion was partial, by proceeding with great caution. In this case, the pupil is contracted and dilated, by varying the degree of light thrown upon the eye. Sometimes when the pupil is circular in a strong light, it will, when dilated in an obscure light, assume an irregular form, and thereby point out the situation and extent of the adhesion.

Though it would be improper to perform the operation of couching, when the eye is in a state of inflammation; yet persons affected with the Lippitudo bear the operation much better than one would expect from the appearance of the eyes in that disease. I have never rejected a patient on this account, but have repeatedly performed it with success, and with very little subsequent inflammation, when numerous vessels of the conjunctiva were turgid with blood, and the eye-lids thickened, provided this state of the organ was habitual.

I do not recommend an operation, if the disease is confined to one eye, while the sight of the other eye remains

perfect. Nor am I hasty in recommending the operation in cases of cataract from external injury, as blows, or punctures of the cornea; having been led from experience to form the same opinion of the disease, when originating under such circumstances, which the late Mr. Pott entertained.* I apprehend that, in such cases, the capsule of the crystalline is generally the seat of the disease; and I have had the pleasure of seeing the opacity disappear gradually, without the use of any other means than those which were proper for removing the inflammation. Such an event, however, does not always follow; and sometimes where the sight is ultimately restored without an operation, the restoration advances by very slow degrees. My late colleague at the General Infirmary, Mr. Lucas, relates a case,† in which “the opacity began to dissipate in a “month” after the accident, which was a blow upon the eye, “and in three months the patient could see with that “near as well as the other eye.” I have seen two cases, where the opacity continued a year before the natural transparency of the capsule began to be restored. In the last case of this kind which I saw, the patient had been blind of the injured eye four years before the opacity began to disappear.

When the cataract is *congenital*, the eyes have often an irregular motion, as if the patient was looking at two distinct objects at the same time. The operation is rather more difficult in such patients, on account of the unsteadiness of their eyes; but it may be performed with safety, when the patient is so far advanced in years as to understand the design of the operation, and has been taught to desire it. I once attempted to couch the eyes of a child two years old, the success of which operation will be related;‡ but I have always, except in this instance, refused to operate on so young a subject.

* Pott's Chirurgical Works, vol. iii. p. 230.

† Med. Obs. and Inquiries, vol. vi. p. 264.

‡ See Case 8.

The habit of persons afflicted with cataracts is so different, that no general rule can be laid down respecting the manner of preparing a patient for the operation. In some cases, the loss of a little blood may with propriety be added to laxatives, and a strict regimen. In other cases, there may be such constitutional debility as to forbid any reduction. In general, I do but require my patients to abstain from animal food and fermented liquors for a few days, and give one dose of a gentle purgative.

During the *operation*, the patient should be seated in a chair somewhat lower than that on which the operator sits, that the arm of the operator may not be much elevated. An elevated position of the arm soon produces fatigue, and renders the hand less steady. The eye of the patient should be exposed to the light of one window only, and that should admit no more light than is necessary for seeing the interior parts of the eye distinctly. If the patient's head is placed a little obliquely to the light, the picture of the objects reflected by the cornea (which often prevents a distinct view of the cataract) is thrown to one side of the pupil, and then creates no impediment to the operation. A horizontal light is in this operation preferable to a skylight. The head of the patient must be kept erect, or inclined a little forwards, by an assistant who places one hand upon the forehead, and another under the chin, supporting at the same time the occiput by a pillow interposed between it and the breast of the assistant. The eye which is not the immediate subject of the operation, should be kept steady by a proper bandage, and by a gentle pressure from that hand of the assistant which is placed upon the forehead. If a speculum oculi is not used, the operator may support the upper eye-lid with the thumb of one hand, and with the ring finger of the other hand, which holds the needle, depress the lower eye-lid till he has

introduced the needle. After that, it is more convenient to have the lower eye-lid held down by an assistant. The tarsus should be turned a little inwards, and the eye-lids gently pressed against the edge of the orbit, and the globe of the eye. I have found the common speculum oculi to be inconvenient, and I have never tried that which is recommended by Mr. Benjamin Bell.* The patient should be directed to turn his eye inwards, as if he were looking at his nose, that the part in which the puncture is to be made may present itself to the operator, and that the conjunctiva may be put upon the stretch. If the conjunctiva remains wrinkled where the needle enters the eye, the operator will find his instrument so entangled as greatly to impede the regularity of his motions.

The needle, being besmeared with oil, should be pushed suddenly through the coats of the eye. The direction in which this is done is of some consequence, especially if a spear-shaped couching needle is used. The needle should not be pushed through the sclerotis in a direction parallel to the iris; for pressure made in that direction is apt to give a rolling motion to the eye, and thereby alter the course of the needle. If the eye be made to roll towards the nose, the point of the needle will then be directed towards the iris, and the operator will be in danger of wounding it. This danger may be avoided by piercing the sclerotis with the point of the needle directed towards the centre of the eye. By this method the eye is rendered steady, and the needle will pass through its coats without any danger of wounding either the iris or ciliary processes.

When the needle has pierced the coats of the eye, it must be pushed forwards in the same direction, till so much of the instrument is introduced, that its point, when brought forwards, will reach the centre of the crystalline. This part of the operation, as I have already observed, may be performed with greater exactness by the use of

* Bell's System of Surgery, vol. iii. p. 244, plate xxx.

a short needle. If the length of the needle is little more than the diameter of the eye, the operator will be greatly assisted in judging when the point of his instrument has advanced to the axis of the pupil, which corresponds with the centre of the cataract. It is not absolutely necessary, that the needle should be introduced at one determinate distance behind the ciliary ligament. Indeed, the want of steadiness in the eyes of some patients renders this impracticable: But I consider the distance of about one-sixteenth of an inch to be the most convenient. The operation may be performed with greater ease and safety, when the needle pierces the sclerotis near the ciliary ligament.

So far the operation must be conducted in the same manner, whatever be the state of the cataract. The remaining part of the operation must be varied according to the circumstances of the disease.

If, in bringing forwards the point of the needle, I perceive the cataract to advance, and dilate the pupil; I then know that the cataract is firm, and that the needle is in contact with its posterior part. The pressure used in bringing forwards the cataract, sometimes causes the point of the needle to sink so far into the crystalline, and to become so much entangled in its more tenacious part, that the depression may be completed though the instrument has not been seen through the pupil. When, therefore, the appearance which I have mentioned takes place, I do not persist in bringing forwards the point of the needle, lest the iris should be injured by the too great dilatation of the pupil; but I depress the point, and at the same time carry it backwards. If this motion of the needle removes the cataract from its place, the operation is usually concluded without any farther trouble.

If the cataract does not follow the motion of the needle, I cautiously bring forward its point through the softer part of the crystalline, till I can see my instrument through the pupil, and then proceed in my attempts to effect the depression. In these attempts I always move the needle

backwards as well as downwards; for the operator ought always to be sure, that his needle is behind the ciliary processes when he moves it upwards or downwards. Before I withdraw the needle, I usually elevate its point a little, to see whether the cataract rises again when the pressure is removed. If it does, the pressure is renewed once or twice, and the needle is then withdrawn. I always endeavour to lodge the cataract below the place where my needle entered the vitreous humour, and withdraw the needle in a direction nearly parallel with the axis of the pupil.

Though I do not think it advisable to persist in pressing an entire cataract into the anterior chamber, when the advance of the cataract causes a large dilatation of the pupil; yet after the needle has wounded the capsule, a firm cataract, or at least its nucleus, will sometimes slip through the pupil without the design of the operator. This has been considered by some authors, as a disagreeable circumstance, and has been ranked amongst the objections to the operation of couching.* On the contrary, it ought to be considered as a favourable event, since the cataract always dissolves in the aqueous humour, and finally disappears without any injury to the eye. This, at least, has been the event in every case of the kind which I have seen. I have six or seven times seen the whole opaque nucleus fall into the anterior chamber of the eye, and very frequently small opaque portions. Indeed, if the cataract could, in all cases, be brought into the anterior chamber of the eye, without injury to the iris, it would be the best method of performing the operation. But this is not usually practicable; the softness, as well as the bulk of the cataract presenting an obstacle to this process.

If the crystalline, or rather its capsule, is found to adhere in part to the iris, great caution should be used in our attempts to destroy the adhesion; as it is much more

* *Memoires de l'Academie de Chirurgie*, tom. ii. 579. Warner's Cases, ed. 3. p. 76—92. Bar. Wenzel.

safe to repeat the operation after a gentle attempt, than by continuing the use of force to risque the danger of an inflammation. It is useful in this case to lift up the cataract with the needle, as elevation may be successful, where depression has failed. Mr. Warner succeeded at the fourth operation, in destroying an adhesion of the iris,* and I have repeated the operation oftener than four times with advantage, rather than incur the hazard of inflammation, which might have left my patient in total blindness.

Hitherto the cataract has been considered as firm, and capable of bearing the pressure of the needle; but in the greater number of cases which have fallen under my care, the cataracts have been found so soft as to permit the needle to pass through them in all directions. In this state of the disease I do nothing more than break down the texture of the cataract, and endeavour to puncture, or tear off, a portion of the capsule, that the aqueous humour may flow in upon the broken cataract. In doing this, it is common to see some fragments of the cataract fall, through the pupil, into the anterior chamber of the eye. I am always glad to see this take place, as I then know that there is a passage opened for the admission of the aqueous humour, and that those opaque fragments, which have passed through the pupil, will soon disappear.

Sometimes the cataract is so uniformly soft, that the passage of the needle through it makes no alteration in its appearance. This species of cataract was considered by the late Mr. Sharp and Mr. Warner as incurable.* In this opinion these excellent authors were certainly under a mistake; for I find, that although an uniform softness of the cataract may require a more frequent repetition of the operation, it affords no permanent impediment to the cure. Upon repeating the operation in such cases I have often found, that the first operation had produced more effect than at the time of operating it appeared to produce.

* Warner's Cases in Surgery, ed. 3. p. 62.

† Sharp's Operations of Surgery, ed. 7th. 163—165. Warner's Cases in Surgery, ed. 3d. p. 73.

The cataract, upon a subsequent operation, appears more broken, and irregularly opaque. Some portions may now be removed, which before appeared immoveable; some fall into the anterior chamber; and the remainder becomes gradually dissolved in its original situation.

When both eyes are affected with a cataract, I usually operate upon them both at the same time; nor have I seen any reason for discontinuing this practice.

I always operate upon the right eye with my left hand. A surgeon may easily acquire the power of using his left hand in this operation, if he accustoms himself to bleed with the left hand, whenever a proper opportunity offers.

After the operation, I cover both the eyes, though one only may have been couched, with a broad piece of linen, spread with unguentum ceræ, and fastened to a ribbon tied round the head. The patient's face should not be exposed to a strong light, nor to the heat of a fire, till the tenderness of the eyes is gone off. A strict regimen should be observed for a few days; and a gentle laxative may usually be given with advantage.

When the nature and variety of the parts wounded in couching are considered, a person not accustomed to this operation might reasonably conclude, that it would usually be followed by a considerable degree of inflammation. Yet I can with truth assert, that when it is performed in the manner above described, the usual consequence is nothing more than a tenderness of the eye, which goes off by degrees, if the patient uses the proper cautions. Frequently the eye appears as free from inflammation as it did before the operation, excepting a slight redness in the conjunctiva, where the puncture was made. Nor is the operation itself attended with that degree of pain which one

might reasonably expect. It is commonly spoken of by the patient as inconsiderable. A lady, whom I couched in this town, was asked by her daughter immediately after the operation, what degree of pain she had felt. Her reply was this: "I expected to have felt an acute pain, though of short duration; but I did not. I only felt as if something was pressing against my eye."

Though the inflammatory affection, which is immediately subsequent to the operation, is generally slight, yet it must be confessed, that it is sometimes considerable; and I have also observed, that the patient's eye is more susceptible of inflammation, from any irregularity, for two or three weeks after the operation. Some of the worst attacks of inflammation, which I have seen, have come on at so distant a period, when the patient, presuming upon the comfortable state in which he found himself, has incautiously exposed his eye to a cold blast of air, or has caught cold by any other means.

In case of subsequent inflammation, I place the greatest dependance upon the evacuation of blood from some branch of the temporal artery. The quantity and frequency of the evacuation must be directed by the circumstances of the case; but it ought to be used freely till the inflammation begins to subside. Purgatives, and other cooling remedies should be added. Warm soft water, directed in a gentle stream across the eye, abates the pain in the acute stage of the inflammation. When that has somewhat subsided, the face, the neck, and head, if not covered with hair, should be frequently washed with cold water.

Sometimes, when the eye is not inflamed, the patient feels pain in the forehead, just above the eye-brow, which is now and then accompanied with sickness or retching. This complaint is the most effectually relieved by an opiate.

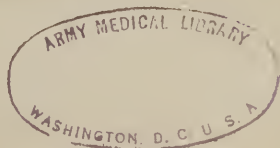
I have seen a few instances where the eye, upon being examined some days after the operation, has appeared to be affected with an amaurosis. The pupil has been found

largely dilated, and the patient has had a weak perception of light. I know not how to account satisfactorily for this accident, which, as far as I have seen, is more alarming than dangerous. In the few cases of this kind which have fallen under my notice, bleeding has appeared to relieve the complaint; the iris has by degrees regained its contractile power, and the retina has been restored to its natural sensibility. One patient, indeed, who came to the General Infirmary from Bridlington, to whom this circumstance occurred, refused to stay in the house till the complaint had ceased, and returning home in cold weather, before the inflammatory tendency had subsided, had afterwards, as I was informed, a severe attack of inflammation. His present state I do not know. Another, whose case I shall relate, was attacked with a temporary amaurosis, after she had regained her sight, and had left the Infirmary.*

It would scarcely be necessary to mention the rising again of the cataract, when enumerating the consequences of the operation, but that some good authors have considered this as a circumstance, which affords an important objection to the operation of couching, and renders it fruitless. This circumstance may require a repetition of the operation, but throws no hindrance in the way of the cure. If the cataract, though risen again into view, appears detached, so as to move sensibly and readily in the vitreous humour, with every motion of the head, it will

* Since these observations were written, a case has occurred, in which the pupil became largely dilated after the operation, and did not regain its natural form. I couched both the eyes of an elderly man in the General Infirmary; and while I was operating upon the right eye, the cataract broke in pieces, and fell into the anterior chamber, at the moment in which I was depressing it with my needle. I imagine that I did not direct my needle sufficiently backwards in the act of depressing, but incautiously touched the lower part of the iris, in consequence of the obscurity which at that instant took place, and hid my instrument from view. A considerable degree of inflammation supervened in that eye, and the pupil remains too much dilated, and vertically oblong. The patient sees very well with the left eye; and even with the right can read a moderate sized print, when assisted with two pairs of spectacles.

This is the only accident of the kind (as far as I recollect), which has occurred to me during the whole course of my practice.



generally, by degrees, subside and finally disappear without any farther assistance.

In two cases I was led to suspect, that the removal of the cataract had detached a small portion of the *membrana nigra* from the ciliary processes. In both these instances, the patient could see distinctly immediately after the operation; but in the course of a week the sight became obscure, though there was no subsequent inflammation, no opacity in the cornea, nor morbid dilatation of the pupil. The cataracts were firm, and were easily depressed; nor did they appear to have risen again. One of these patients complained that objects appeared blue to her; but her sight remained sufficiently good to enable her to do the ordinary business of her house. The other patient came from Cumberland, and I have had no opportunity of knowing what degree of sight he continued to enjoy.

A frequent and most important consequence of the operation, and one that succeeds the method of extraction, as well as that of depression, is an opacity of the capsule of the crystalline. This *secondary* cataract will appear when no inflammation has succeeded the operation. It will sometimes disappear by the effect of time, as in cases of cataract from blows or punctures; but this event is often slow, and always uncertain. If time does not remove this disease, recourse must be had to the needle. When an aperture has been made in the centre of the capsule at the time of the depression, and remains so large as to enable the patient to see distinctly, the opacity of the surrounding part of the capsule need not be regarded. But if any opaque portions occupy the axis of the pupil, and do not soon shew some return of transparency, it is proper to repeat the operation, for the purpose of breaking asunder, or removing, the opaque portions.

When portions of the opaque capsule hang floating in the posterior chamber of the eye, it is difficult to pierce, or lay hold of them. The attempt to remove them must be made in different directions, yet with great caution, lest the iris should be injured. I have sometimes succeeded in detach-

ing these portions by moving my needle upwards, when the motion downwards has failed to lay hold of them.

When the capsule appears in cross threads like net-work, the instrument will readily break them asunder. Sometimes the capsule has a considerable degree of elasticity, and springs up again immediately with force after being depressed. When fragments of this kind are near the circumference of the crystalline, and do not materially interrupt the passage of the rays of light, it is the most prudent method to leave them, lest the ciliary processes should be injured by tearing them off.

As the opacity of the capsule, which forms the secondary cataract, is usually diminished in some degree by time, I consult the inclination of my patients with respect to the time and frequency of these secondary operations. A labouring man, who has a family to maintain by his work, will not, perhaps, regard a frequent repetition of the operation, that he may the sooner return to his labour. Persons of a higher rank often prefer a delay. The lady, whose description of the pain arising from the operation I have already mentioned, had a secondary cataract in each eye. She chose to have the operation repeated upon one eye, and to wait the effect of time upon the other. Both methods succeeded; but there was no return of transparency in the capsule of that eye for which the needle was not employed, till about six months after the depression of the cataract. A gentleman of my acquaintance, from whom the late Baron Wenzel extracted two cataracts, had a secondary cataract in both eyes. The opacity continued two years after the extraction of the cataracts. After that time I had no opportunity of examining his eyes, but was informed that his sight had improved before his death, which happened about two years after I last saw him. I never knew but one instance in which the broken fragments of the capsule coalesced, and became re-united. This case I shall relate.

I have often seen, in persons who have been couched, and sometimes in those who have never had a cataract, a

tremulous motion of some transparent substance in the anterior chamber of the eye. May not this be owing to some portion of the vitreous humour which has passed through the pupil? I never saw any degree of opacity in this substance, nor does it seem to create any impediment to perfect vision.

The vitreous humour does not appear to suffer the least injury by the passage of the needle or cataract through it. If there was any tendency in this humour to become opaque, we should frequently see this consequence ensue from the operation of couching. But no such consequence, I believe, was ever known to ensue. On the contrary, this humour seems to be in as proper a state for the transmission of light after the operation, as it was before.

Surgeons, who undertake the operation of couching, should not be induced by their desire of completing the cure at one operation, to use long continued efforts to depress or break down a cataract. By such efforts there is great danger of injuring the eye. It has been too much considered as a matter of disgrace to the operator, if sight has not been immediately restored to the patient. The fear of this disgrace has probably consigned many an unhappy sufferer to irremediable blindness. A cautious procedure, though more slow in its progress, will more surely arrive at the desired end. Neither the pain, nor the danger attending the operation, is great, if it be conducted with caution; and when a patient has been informed of the operator's design, and finds less inconvenience from the operation than his fears had led him to expect, he will seldom object to that treatment which affords him the greatest hope of regaining the blessing of sight. When custom has reconciled our patients to hear without surprize, that a repetition of the operation is often necessary to effect a cure; they will no more think this circumstance a disparagement to the art, than when they hear that repeated bleeding is often necessary to cure an inflammation. One principal thing to be kept in view by the operator is, to do no harm. If he secures this, he will almost certainly

do some good, and often much more good than he expects. An operation may be performed without the least apparent advantage at the time, and yet in the end may prove the means of cure. The operation of couching has been, till of late, chiefly confined to itinerant oculists, whose mode of life requires despatch. They are therefore obliged, let the state of the cataract be what it may, to continue their efforts till it is either removed, or so far broken down, that some rays of light may be immediately admitted. Various objects are then presented to the patient, and if he can discern them, he is pronounced cured, and prompt payment is required, without regard to the future consequences which this method of treatment may produce. I am convinced that many persons, whose cases were not incurable, have been rendered totally and irrecoverably blind by this mode of procedure, when there was no want of dexterity in the operator.

When I consider the opinion of those eminent surgeons, Mr. Samuel Sharp and Mr. Warner, respecting the effect of this operation, I cannot avoid concluding, that the method of couching above recommended is preferable to that which has been commonly practised. Mr. Sharp's words are, "After all, there will sometimes ensue a troublesome ophthalmia, which, *with the uncertainty there always is of success* after the operation, have deterred most surgeons from undertaking it."* And Mr. Warner says, "It is necessary to be assured, that the success of this operation, *which at best is precarious*, is much more so, when there is an adhesion of any part of the diseased *crystalline* to the *tunica iris*."†

There is no operation of surgery which may not sometimes fail of success; but couching, when conducted in the manner above advised, so rarely fails to restore a considerable degree of sight, if the cataract is not complicated with any other morbid affection of the eye, that it cannot be considered as attended with *much* uncertainty.

* Operations of Surgery, ed. 7. p. 165.

† Cases of Surgery, ed. 3. p. 57.

I should have been glad to have drawn a fair comparison between this operation and that of extraction; but as I have already observed, it is not in my power to do this from my own experience. I never performed the operation of extraction but once, and then took every precaution to insure success. I chose a patient who had a cataract in each eye, who was free from any apparent tendency to inflammation in the eyes, and whose cornea was sufficiently prominent. I extracted the cataract from the left eye, that I might have the advantage of using my right hand. No accident occurred in the operation; and great care was taken to prevent a subsequent inflammation: yet the inferior half of the cornea became opaque, so as to deprive my patient of the benefit of the operation.

The event of this case gave me so much concern, that I never attempted the operation again. I afterwards couched this patient's right eye with my left hand as usual, and she regained the complete sight of that eye.

Recollecting the place where the poor woman lived, who was the subject of these operations about eighteen years ago, I lately made some inquiry concerning her. I found that she had been dead about nine years. I met with her daughter (a middle aged woman), and was informed by her, that her mother had continued to enjoy the sight of her right eye as long as she lived, and was able to read her Bible, though a small print, with great readiness; but that she had never been able to distinguish objects with the left eye, unless such as were placed above her.

If I may be allowed to judge from the reports of several of my pupils, who, after seeing for some years the practice of the General Infirmary at Leeds, have been pupils at other hospitals, where the method of extraction is adopted, I should conclude, that the advantages are greatly in favour of the mode of depression above described.

It deserves to be here remarked, that the operation of couching is less difficult than that of extraction. Of this

opinion was the late Mr. Sharp;* and no inconsiderable testimony to the validity of this opinion is afforded by the following fact, that all the patients who undergo the operation of extraction, in one of the principal hospitals of the metropolis, are committed to the care of one surgeon, though the rest of the surgeons, who decline this operation, are in the habit of performing all others, which the cases of their respective patients may require.

I have subjoined a few cases, by way of illustrating some of the observations made in the preceding pages.

CASE I.

Cataract with Lippitudo.

June 22d, 1775, I couched both the eyes of an old man, whose case was attended with the following unfavourable circumstances. His eye-lids had been sore and turgid for some years. His eyes were watery, and appeared to be in an irritable state. The left cataract was firm, and was removed intire; but the right was rather soft, and suffered the needle to pass through it. The next day his eye-lids were a little more swelled, and he complained of a slight pain over the right eye-brow. His left eye was not at all inflamed; and the conjunctiva of the right had very little more redness than before the operation.

July 1st. His right eye was quite easy, and he could see a little with it. The cataract in the left eye appeared again; but in a few weeks it became sensibly wasted. His sight was gradually restored, so that at the end of September following he could see very well.

In the year 1799, I couched both eyes of the Rev. Mr. Pattenfon of Ripponden, which were in the same morbid state as that above described, and had been so for many

* Critical Inquiry, ed. 4. 264.

years. The operation was twice performed upon each eye, with the interval of a few weeks; but at neither time did it cause much alteration in the thickening of the eye-lids, or turgid state of the vessels of the conjunctiva. Sometime after his return home, he wrote to me to inform me of his comfortable situation, which he thus describes: "I thank God I can do my duty in the church, and in the school, with almost as much ease and comfort as at any former period of my life."

Mr. Patten's eyes were in so tender a state before the operation, that he had been in the habit of wearing a green shade upon his head. In reference to this he makes the following observation in his letter: "I have no pain in my eyes, and feel no inconvenience from walking without any shade over them, except in a strong sun."

CASE II.

Soft Cataract.

In 1776, William Birkenshaw of Billingley, who had lost one eye, came under my care at the General Infirmary, on account of a cataract in the other. I found it uniformly soft and yielding, permitting the needle to pass through it in any direction, without changing its position or appearance. At the request of my patient, I repeated the operation after a short interval, but with no greater success than before. Not discouraged myself by this apparent failure, I explained to the poor man the reason of the hope which I entertained of succeeding finally by a repetition of the operation. He gained confidence by my representation, and as he had a large family to maintain by his labour, and was, therefore, anxious to regain his sight as soon as possible; I yielded to his solicitations, by repeating the operation with shorter intervals than usual. The cataract

put on by degrees a broken appearance; and being partly dissolved, or restored to transparency, and partly removed by the needle, a perfect cure was at length obtained. I couched him seven times, yet he never seemed to have the least fear of the operation. He had rarely any redness in the conjunctiva in consequence of the operations, except about the puncture, and seemed to suffer very little from them. I saw him about two years after his cure, when he informed me with great pleasure, that he was then able to maintain by his labour a family, consisting of his wife and seven children.

CASE III.

Partial Adhesion of the Iris to the Cataract.

John Healde, aged twenty-three, was admitted into the General Infirmary in June 1774, on account of a cataract in his left eye. I was apprehensive, from the appearance of the part, that the disease was seated in the capsule of the crystalline, rather than in the humour itself; for a small portion in the middle of the cataract was transparent, while the upper and lower parts were opaque. The upper opaque part appeared thin; but the lower appeared thick and shrivelled, and was of a pale yellow colour.

The right eye was enlarged, and distorted; having an opaque crystalline, and an immoveable iris.

The patient gave me the following account of his case. He was struck upon the left eye by a cinder thrown at him when he was seven years old. A violent inflammation succeeded the injury, and ended in a total loss of sight. He remained blind of this eye till he was nineteen. About that time the right eye became dim, and enlarged; yet in the left he regained a small degree of sight, which had continued, so that he could conduct himself in walking, though he could not execute his ordinary business. There

was a tremulous motion observable in the anterior chamber of the left eye, though the fluid which it contained was transparent. The iris was a little concave anteriorly.

I performed the operation June 7th, and found the two opaque portions connected with the crystalline, and the superior one adhering to the iris. I could not readily break this adhesion, and therefore left the parts in their former state, after making such attempts to detach the cataract, as I judged consistent with the safety of the eye. He seemed to suffer more pain than usual from the operation, and became sick with it. The pain ceased in about an hour and a half, and never returned, except that he had now and then a slight pricking sensation in the eye.

June 24th, I couched him a second time, but could not separate the upper part of the cataract from the iris. No inflammation succeeded the operation.

July 4th, he was couched the third time. The cataract still adhered to the iris, but not so firmly as before. No inflammation supervened.

12th, I operated the fourth time, but without success. The needle always pushed the cataract in part through the pupil, when I attempted to detach it; but it returned immediately to its former situation. No inflammation.

20th, I couched my patient the fifth time, and then succeeded in destroying the adhesion, and removing the cataract. I could not perceive any part of it the next day; but it afterwards rose up gradually, and regained its place.

August 6th, I performed the sixth operation. The cataract was again removed, and appeared no more. No inflammation supervened. The man was shortly after discharged cured.

By this gentle procedure, I was enabled to destroy a very strict adhesion of the crystalline and its capsule to the iris, without injury to this delicate membrane. I am strongly inclined to believe, that had I, through fear of being foiled in an operation, broken down the adhesion at

once, I should have sent my patient home in total darkness: whereas I had the pleasure of seeing him restored to as perfect a degree of sight, as is usually enjoyed with the loss of the crystalline humour.

It seems as if the crystalline, though not opaque itself, had adhered to the opaque capsule. It is also worthy of observation, that the capsule had spontaneously regained some transparency, in its central part, after having remained in an opaque state during twelve years.

CASE IV.

Total Adhesion of the Iris to the Cataract.

In October 1800, Mr. James Holgate of Hawkesworth, woolstapler, aged twenty-one years, was brought to me by his father, on account of a loss of sight, and gave me the following history of his case.

About a year and a half before this consultation his eyes became inflamed, and his sight began to diminish. The diminution of sight increased gradually during the course of a year, till he became so blind, that he could merely perceive a glimmering of light, or a bright red colour; but could distinguish no object. In that state he had continued for half a year without any amendment.

The capsula of the crystalline humour was uniformly opaque, and of a white colour. It adhered universally to the iris, so that there was not the least perceptible alteration in the size of the pupil upon varying the degree of light to which the eye was exposed. Both eyes were in the same state. They were rather prominent, but were not now in an inflamed state.

I informed the young man and his father, that I could not entertain much hope of a cure in such a case as this; but that, if the young man was desirous of submitting to an operation, under such a state of uncertainty, I would do

every thing for him which was in my power. I informed them also, that as the operation could not well diminish his sight; so neither was it likely to injure the appearance of his eyes. There was a possibility of its proving in some degree beneficial. The young man was very desirous that I should make an attempt to restore to him some degree of sight, if there was but a possibility of doing him good by the operation.

After keeping my patient a few days on slender diet, and giving him a gentle laxative, I operated on both eyes; but found the adhesion of the capsula to the iris so firm, that I could not make an evident separation in any part, without using more force, and continuing my efforts longer, than I judged to be prudent.

Notwithstanding this failure, my patient was not discouraged. He had felt less pain from the operation than he had expected; and having no inflammation in his eyes after it, excepting a slight degree of tenderness, he was desirous that I should renew my attempts, as soon as I should judge another operation to be proper.

Upon repeating the operation, his perception of light was a little increased, though I could not discern any decided separation between the capsula and iris.

Encouraged by a gradual amendment, and the trifling degree of tenderness in the eyes, which succeeded each operation, I pursued my plan with steadiness, at the earnest solicitation of my patient, and repeated the operation about once a month.

After the fifth operation he could discern the pointers upon the face of his watch, when he placed it in certain positions, suited to the breaches which were now made in the capsula.

These breaches were gradually enlarged; but some operations were more successful than others. The eighth increased much the sphere of his vision; but the eleventh made a greater alteration than any which had preceded. By this operation the greatest part of the capsula in the

right eye was removed, and that of the left eye was considerably detached.

He had before this time walked without a guide in a private yard adjoining to the house where he lodged; but his sight was now so much improved, that he was able to walk alone through the crowded streets of Leeds.

After the twelfth operation, I advised him to return home, and to wait for some months the event of these attempts to restore his sight. He complied with this advice, though with some degree of reluctance, having received so much benefit from the operations, and being desirous of obtaining as soon as possible that accurate sight which his business required. Whether this will ever be obtained is a matter of some doubt; but the advantage and comfort which he now enjoys are not inconsiderable.

CASE V.

Fragments of the Capsule coalescing.

In May 1769, Ruth Powell was received into the Infirmary for a cataract of the right eye. The left had been couched eight months before by an itinerant oculist, who punctured the cornea (as I was informed) to let out the aqueous humour rendered turbid by the operation. The subsequent inflammation had caused an obliteration of the pupil.

I depressed the cataract very readily with a round needle, and it did not reascend; yet my patient received very little benefit from the operation. Upon examining the eye a few days afterwards, the capsule was found to have become opake, though it was transparent at the time of the operation. I had punctured it with my needle; but the puncture having been made below the centre of the pupil, the rays of light could not fall upon the retina, except when the pupil was largely dilated. When the pupil was much

contracted in a strong light she could discern no object, for the iris then covered the broken part of the capsula.

The inflammation which succeeded this operation was so trifling, that she walked about the ward, with her eye uncovered, before the expiration of a week.*

I performed a second operation a fortnight after the former, with a view of tearing in pieces the remains of the capsule, or at least, of enlarging the aperture which I had before made in it. The resistance given to the needle by that delicate membrane, floating in the aqueous humour, was so small, that I found it difficult to tear off any part of it, and impossible to remove the whole. The attempt, however, was not unsuccessful; for her sight was so much improved by it, that she was enabled to follow her usual employment without difficulty.

She continued to enjoy distinct vision for two or three years, and then began to complain of some dulness in her sight. I examined her eye, and observed, that the remaining fragments of the capsule, which had hung loose, and left an aperture almost as large as the pupil in a moderate light, now formed two small transverse threads, which rendered vision somewhat indistinct. I advised a repetition of the operation, and at first she seemed desirous of it; but finding that she could still execute her business tolerably, she deferred procuring a re-admission into the Infirmary, and finally remained satisfied with the advantage she had received.

It is difficult to conceive how such a coalescence of the small and floating fragments of the capsula, as I have described, could happen.

* I mention this as a fact, but I do not recommend, nor usually permit it.

CASE VI.

Temporary Amaurosis from Inflammation.

May 28th, 1772, I couched both the eyes of Sarah Newsome. The subsequent inflammation was trifling, and disappeared the third day. June 12th, I repeated the operation on the left eye, and performed a third operation the 25th of the same month. The two latter operations were followed by no greater inflammation than the first.

The cataract in the right eye, which had been broken at the first operation, disappeared so fast, that no repetition was required.

When she could distinguish objects in the fields before the Infirmary with the right eye, she was dismissed, with directions to return in about a month, that her eyes might be examined.

Upon her return I was surprized to find, that she had lost that degree of sight in the right eye, which she enjoyed when she left the Infirmary. Yet the cataract had not appeared again; nor was there any opacity to be perceived in the cornea, or capsula of the crystalline. The pupil was too much dilated, and the iris did not contract upon exposing the eye to a pretty strong light. In short, the eye appeared to be affected with an *amaurosis*.

Upon inquiring into the cause and progress of this unexpected complaint, the patient informed me, that in returning home, when dismissed from the Infirmary, she had caught cold, which brought on an inflammation in the right eye, and a gradual loss of sight. The redness of the conjunctiva had nearly disappeared; but she still felt a tenderness of the eye.

From a consideration of these circumstances, I was led to suspect, that the complaint was of an inflammatory na-

ture, and accordingly I ordered her to be bled immediately, and directed a purgative to be taken the following morning. These means afforded the wished-for relief, and the eye was restored to its former state.

I saw this patient February 17th, 1799, twenty-seven years after the operation, and she then enjoyed her sight as completely as the loss of the crystalline humour will admit.*

CASE VII.

Cataract rising again.

In 1770, Ann Jenkins was admitted a patient of the General Infirmary for a cataract in one eye, the crystalline of the other being also slightly opaque. I depressed the cataract without any considerable difficulty. On examining the eye two days after the operation, I perceived the cataract to be in its former situation.

When the tenderness of the eye was removed, the operation was repeated, and at my first examination the eye had a good appearance. The patient also found her sight restored. But as the tenderness of the eye decreased, the cataract rose again, till it came nearly into its original situation. She was now made an out-patient, and about a fortnight after she had left the house, she became sensible of some amendment in her sight, and came to me requesting that I would examine her eye. I observed that the cataract had already begun to subside. In a short time afterwards it disappeared, and she regained her sight.

* Spectacles are generally necessary for those who have lost the crystalline humour. I have had some patients, who, when first restored to sight, have been under the necessity of joining two pairs of spectacles for a time, and afterwards have been able to see well with one pair.

CASE VIII.

Secondary Cataract.

In October 1780, I couched both the eyes of a girl, eight years old, the daughter of William Myers of Stainburn. The cataracts were soft, and permitted the needle to pass through them in all directions, without removing them from their place in the vitreous humour. They appeared a little broken; but no part was made clear by the operations. The eyes remained tender, but no inflammation supervened. I sent her home to wait some months before I should repeat the operation.

In June 1781, she came again under my care. She now could see very well with her right eye. The capsula of the crystalline, which I had ruptured at its centre with the needle, was retracted on all sides towards its attachment at the circumference of the crystalline. There was an aperture left as large as the pupil in a strong light; but in a moderate light, the remainder of the capsula appeared all around, just within the edge of the iris.

In the left eye, the broken fragments of the capsula adhered to each other, so as to prevent the direct rays of light from falling upon the retina. She could, therefore, see no object distinctly with the left eye.

I did not think it necessary to run any risk, by attempting to enlarge the field of vision in the right eye; but I removed the opaque capsula in the left eye, which readily yielded to the pressure of the needle. Having laid hold of the capsula near its centre, where it formed some transverse opaque threads, I found it to be more firm there than at its circumference, for the whole of the capsula was removed at one effort.

The crystalline humour seemed to have been dissolved since the former operation; for I could discern nothing opake except the capsula.

The operation was attended with very little pain, and no inflammation succeeded. The patient saw well, and could bear a strong light within a fortnight after the operation.

I saw this patient in 1782. A small portion of the capsula, which I had removed appeared towards the external canthus of the eye; but it projected so little, that it seemed to afford no hindrance to distinct vision.

Since the restoration of sight in the left eye, she had begun to squint a little with the right, in which there remained a circle of opake capsula, as above-mentioned.

CASE IX.

Cure obtained by making the Needle pass through the Cataract.

A child of two years old was admitted into the General Infirmary, on account of a congenital cataract in each eye. She could discern a glaring light, as a lighted candle, or burning coal; and could also, in a strong light, discern some of the most vivid colours. The motion of her eyes was usually parallel; but she often placed them for a short time in different directions, as if she was looking at two distinct objects. She rolled them about much, which made her sometimes appear like an idiot, though she was a very sensible child. She was often moving her hand with rapidity before her face, when placed opposite a window, and delighted to blow out a candle, and do other similar tricks, that made a variation in the sight which she possessed.

I attempted to couch her left eye, but was repeatedly prevented by the difficulty of holding her steady, and by

the power which she had of retracting her eye within the orbit, and thereby rendering the conjunctiva flaccid. She could do this in so great a degree, as sometimes to hide the whole of the cornea by the wrinkled conjunctiva, which then lay in folds before it. I once succeeded so far as to penetrate the eye with my needle, and just move it through the cataract; but her wriggling motion made any continued attempt to depress the cataract so hazardous, that I was glad to withdraw my instrument without doing any injury to the eye.

The child was dismissed till a more advanced age should render the operation less hazardous.

About three years afterwards, being in the neighbourhood of the child's parents, I looked in upon them for the purpose of seeing the child, and was agreeably surprized to find the left eye, into which I had introduced my needle, almost clear. The restoration of the child's sight (for it was now in part restored) had been so gradual, that her parents could not inform me of the time when she began to discern objects.

The rolling motion of the eyes still continued.

CASE X.

Pain above the Eye-brows.

In 1799, I couched the right eye of Mrs. Spotswood of Lincoln, an elderly lady. The night after the operation she complained of much pain in the forehead, just above the eye-brow, attended with sickness at the stomach; but there was no appearance of inflammatory affection in the eye. I gave her a gentle laxative, and after that an opiate, which removed the painful sensation, and the sickness. Her case required a repetition of the operation. I couched her eye four times before the opaque portions of the capsule were sufficiently removed. The pain, which had affected

her after the first operation, never returned, nor did the least inflammation supervene. After the three latter operations, she informed me that the pain caused by the puncture ceased so soon, that she felt no uneasiness after I had left the room in which I had operated. Indeed the uneasiness ceased almost as soon as I had withdrawn my needle, and did not return.

The year following this lady favoured me with a letter, very well written by her own hand.

Opiates have always, as far as I can recollect, relieved the complaints above-mentioned, even when they have been accompanied with some inflammatory affection of the eye.

This lady's case was by no means a favourable one, as there was too great a contraction in the pupil previous to the operation; so that I considered the success as more doubtful than usual. The left eye was in so morbid a state, that I did not operate upon it.

CASE XI.

Contracted Pupil.

In September 1793, Mr. Champley of Thornton, near Pickering, aged seventy-two years, consulted me on account of a loss of sight in both eyes.

The left eye appeared to be affected with an amaurosis, the right eye with a cataract. He could not distinguish one person from another, nor was he able to walk abroad without some person to conduct him.

The right eye was by no means in a favourable state for the operation, as the pupil was much contracted, and the iris almost immovable. A very slight motion of the iris might be perceived upon exposing the eye suddenly to a strong light. In the twilight he had a small perception of

light with this eye; but in a strong light the pupil was so much contracted that he could see nothing.

I explained to my patient, and to his nephew, a sensible young man who accompanied him, the nature of the diseases with which his eyes were affected, and proposed the removal of the cataract in the right eye, though my hopes of success were not sanguine. However, as a failure in my attempt to restore the sight would not make his condition to be worse, my patient consented to the operation.

The great difficulty in this case was, to know when the point of my needle was brought into a proper place for depressing the cataract, as I could not see the instrument through the pupil. The shortness of my needle greatly assisted me in this dilemma. When I had introduced it as far as I judged proper, I brought forwards its point towards the pupil; and observing that in this motion the cataract was made to advance, and dilate the pupil, I was certain that the instrument was then pressing upon the posterior part of the crystalline, in which its point might now probably be entangled: I therefore turned the point backwards, and had the pleasure to see the cataract carried away by it. The cataract disappearing as I depressed the point of my needle, I turned the point backwards towards the outer canthus of the eye, and then withdrew the needle in a direction parallel to the axis of the pupil.

Mr. Champley had very little uneasiness after the operation, but was anxious to return home, as he apprehended he had received no benefit from the operation. I could not prevail upon him to stay longer than a week at Leeds. Before his return, I procured some cataract spectacles, and requested him to make a trial of their use. He was surprised to find, that by the assistance of a pair moderately convex, he could distinguish the faces of the persons in his room, and describe their dress. He could also distinguish capital letters in the title page of a small dictionary, which lay upon the table. He discerned the small figures in a paper with which the room was hung, but mistook a little

the colour of the ground of the paper. In several trials which I made, I found that he could distinguish figures better than colours.

Before I conclude my observations on the Cataract, I shall take some notice of the objections which Baron Wenzel has made against the operation of couching, and then contrast the inconveniences of this operation with those which he allows to arise from the method of extraction. I judge this comparison the more necessary, as I have already observed, because Mr. Ware, the translator of the Baron's Treatise, seems to coincide intirely with his author in these objections; and because I know that many surgeons consider the practice of couching as obsolete, and greatly inferior to that of extraction.

The Baron treats this operation with some contempt. "I think it unnecessary," he says, "to enter further into an explanation of the different modes of depressing the cataract, since this operation is at present almost universally exploded."

Ware's Translation, p. 18.

He begins his Section on the accidents produced by couching, with this observation, that "the objections against couching, are infinitely greater, and the effects of it much more to be dreaded," than those of extraction. He then enumerates the following accidents to which the operation is liable.

1st. "The pain is severe during the operation." On this head I have given the language of one lady* (the late Mrs. Scott of Leeds) who was asked concerning the pain immediately after I had operated. The account which she gave may be considered as a fair specimen of the pain at-

* Page 48.

tending the operation in general. There is undoubtedly a difference in the sensibility of different persons; and some patients may express a greater sense of pain on account of a greater difficulty in removing the crystalline or opaque capsula; but patients frequently express surprise at the small degree of pain caused by the operation, and rarely speak of it as a very painful one. The sincerity of their expressions is confirmed by the readiness with which they submit to a repetition of the operation, and not unfrequently by a request for such repetition.

2dly. "The vomiting, which frequently comes on at the distance of some hours after the operation, is apt to produce a collection of matter in the eye." I shall reserve what I have to say on collections of matter in the eye, till I answer the third objection, in which this consequence is attributed to the puncture of the retina and ciliary nerves. With respect to the vomiting, which is here said frequently to occur, my answer is, that it does not frequently occur; and whenever it has occurred in any of my patients, it has been speedily removed by an opiate.

3dly. "The pain produced by the puncture of the retina and the ciliary nerves, is often followed by a suppuration of the eye."

I have now practised the operation of couching pretty frequently for thirty-three years, though I have not kept a list of all the patients upon whom I have operated. I have also seen the operation performed frequently by my colleagues at the Leeds Infirmary: but never yet saw an instance of a suppuration of the eye, in any patient who has come under my care in private practice, nor in any case that has occurred at our public hospital.

4thly. "Those persons who have undergone the operation of couching, sometimes feel constant and violent pains in the eye as long as they live."

In this objection I leave the Baron to judge by his own experience. I never knew this consequence to follow from the operation in any of my own patients. An old woman

was admitted into the General Infirmary at Leeds, on account of a cataract in each eye, accompanied with a chronic ophthalmia. She remained several weeks in the house, before the ophthalmia could be so far removed as to make it advisable to perform the operation for removing the cataracts. When the inflammatory affection seemed to be subdued, the operation was performed with success, and the poor woman continued in a comfortable state for about ten days. The ophthalmia then returned, and could never afterwards be completely subdued. A great variety of means were used with temporary advantage, but this was always followed by a relapse, which often came on suddenly, without any apparent cause. I was at last obliged to send my patient home with an incurable ophthalmia. This is the only instance of the kind which has occurred to me, and which could not be attributed to the operation, as it had subsisted a long time before she came under my care. This is a different case from the lippitudo, where the vessels of the conjunctiva are turgid, and the eye-lids thickened, without any acute inflammation.

5thly. "In introducing the couching needle, the blood vessels, both of the choroides and retina, are liable to be wounded, and the extravasated blood not only confuses the sight of the operator, but, unless speedily absorbed, is very apt to produce a suppuration of the whole eye."

I have often punctured the blood vessels of the conjunctiva, but in this case, the blood, which seldom exceeds a drop or two in quantity, is always discharged upon the globe of the eye. I do not recollect a case in which I perceived any blood to flow from within, so as to mix with the aqueous humour. But if this accident should occur, the operator may withdraw his needle, and postpone the remaining part of the operation.

6thly. "The soft and milky cataract cannot be depressed by the needle; nor can the needle be employed in such a case with any prospect of success."

This objection is not founded in fact, as I could bring abundant testimony to prove, if it were necessary. The softness of the cataract generally requires a repetition of the operation, but does not prevent the patient from receiving a cure. A soft cataract has in some respects the advantage over a hard one, as the former is less apt to adhere to the iris; and consequently there is less risk of deranging the ciliary processes, or their investing membrana nigra, by breaking down a soft cataract, than by removing a hard one.

In the close of this objection the Baron denies, "that the milky cataract, when placed in the anterior chamber, will gradually dissolve and disappear."

It frequently happens, that portions of a soft cataract fall through the pupil into the anterior chamber of the eye, and sometimes the whole of a solid opaque nucleus. In every case in which either of these accidents has occurred, the opaque portions have gradually dissolved in the anterior chamber, and have finally disappeared without any injury to the eye. I am so well convinced that this consequence may be expected, that if I could make the cataract pass, in every case, into the anterior chamber, without injury to the iris, I should prefer this method of terminating the operation to any other. I will not say, that the crystalline always becomes dissolved when placed in the inferior part of the vitreous humour; but this is of no consequence, if it never appears again to obstruct the rays of light which pass through the pupil.

7thly. "After the crystalline humour has been depressed in the best manner possible, it is liable to rise again."

This objection is true, but of little consequence. A repetition of the operation is not in this case always necessary, as the crystalline will sometimes spontaneously subside and disappear (see Case VII.) and when it does not, a repetition of the operation has never failed, within the compass of my experience, of being attended with success.

8thly. "The ciliary processes, which surround the crystalline, are liable to be wounded by the different movements of the needle."

This objection applies chiefly to the spear-shaped needle, in which the point projects beyond that part of the instrument by which the depression is effected. This inconvenience is obviated by the form of the needle which I have above recommended. In the use of this instrument the crystalline is depressed by its extreme part, which alone is sharp, though not pointed, and which need not be brought into contact with the ciliary processes. The ciliary processes are in the greatest danger from the adhesion of a firm crystalline or opaque capsule, and are equally liable to be deranged by the removal of the diseased part, whether the operation is performed by extraction or depression.

9thly. In the fifth Section of the Baron's Treatise it is asserted, that "the case of an opaque capsule of the crystalline is entirely out of the reach of the operation of couching."

The cases which I have related have already shewn the fallacy of this objection. I have shewn that the needle may be used with success, not only in the case of a simple opaque capsule, which is often removed with as great ease as the opaque crystalline, but also when there is a partial, or even a total adhesion of the capsule to the iris; though some of the advocates for the operation of couching have seemed to give up this last case in despair.

If an opaque and adherent capsule could always be removed with safety, by a single operation of extraction, I should readily allow that, in this instance, the operation would be superior to that of couching. But, "notwithstanding a few instances of success," the Baron himself allows that his operation in this case is of very doubtful event. "If the opaque capsule adheres to the iris, and an attempt to extract it be persisted in, there is danger of separating the iris from its connection at the outer margin, and inducing blindness from this cause." p. 26.

10thly. A tenth objection against couching occurs in the sixth Section, where the Baron is examining the objections against extraction. "A secondary cataract, by which
" I mean an opacity of the posterior capsule of the crystalline lens, takes place much oftener after the operation
" of depressing the cataract, than after that of extracting
" it." p. 25.

What reason the Baron has for supposing that it is the posterior, rather than the anterior capsule of the crystalline, which forms the secondary cataract, I cannot tell. I am of opinion, with Mr. Ware, that the anterior portion of the capsule is generally the seat of this disease. So it has appeared to me in operating for the secondary cataract. It is not in my power to determine whether this disease takes place "much oftener after the operation of depressing the cataract, than after that of extracting it." Neither can the Baron determine this, I should suppose, from his own experience. The secondary cataract does certainly follow both methods of operating; and if it does not spontaneously disappear, a repetition of the operation becomes necessary in both methods. When the opaque capsule has been broken, and hangs in fragments from its circumference, it is often difficult to tear off these pieces, as they give so little resistance to the needle. This I think to be the principal difficulty, which the operation of couching has to overcome. Yet a cautious repetition of the operation will rarely fail to make such an aperture in the capsule as shall enable the patient to read with glasses, and consequently to enjoy his sight for purposes of less difficulty.

11thly. "A total closure of the pupil is a misfortune
" which rarely happens after the operation of extraction,
" but much more frequently after that of couching."
p. 24.

I have seen this consequence from the operation of an itinerant oculist; but it has never occurred in my own practice, nor have I ever seen an instance of it after any operation performed by my colleagues at the General Infirmary.

I have now considered every objection of consequence urged by Baron Wenzel against the operation of couching; and shall proceed to examine those which he allows to lie against that of extraction.

1. The *Staphyloma* is one consequence of the operation of extraction, from which that of couching is entirely free. By this term Baron Wenzel means a projection either of a transparent membrane (concerning the nature of which the Baron and his translator differ in opinion), or of the iris through the wound made in the cornea. This accident is allowed to happen sometimes "under the best management," p. 240. I shall take no farther notice of the transparent staphyloma, since it is represented as a curable complaint. But is it possible to conceive, that the interior edge of the iris can be drawn so far from its proper situation, as to the exterior part of the cornea, and remain there, without injury to the patient? With respect to the deformity which this accident occasions, let the reader consult Sir James Earle's late publication on the cataract, in which he will see the sketch of an eye so deformed.

From this author's account it will appear, that in one instance at least, this species of staphyloma was accompanied with blindness. I leave to the abettors of extraction to prove, that it ever happens without some degree of inconvenience to the patient.

2. The loss of the vitreous humour, in whole, or in part, is another and not unfrequent consequence of the operation by extraction. And though this accident may not always prove injurious; yet it is allowed sometimes to diminish, and sometimes to destroy the sight of the patient, "In some patients, even a considerable effusion has not prevented the success of the operation; though in others, it must be owned, this accident has much diminished the clear perception of objects." p. 23. Again, "She submitted to have one cataract extracted by an oculist of that city" (Paris) "but without the smallest success; and the failure I imputed to the escape of almost the

“ whole of the vitreous humour, together with the crystalline.” p. 192.

In one case which the Baron relates, there was a loss of three-fourths of the vitreous humour, notwithstanding which the patient regained her sight; but his remarks on this case shew clearly the danger of such an accident. “ I could not refrain from giving up the eye as entirely lost.” p. 169, Note. Again, “ To my great surprise, she distinguished every object she looked at, which, considering the accident, was almost incredible.” p. 170.

In another case, “ the violence of retching,” which immediately succeeded the operation, “ caused an extravasation of the vitreous humour, and, in consequence of this, a total loss of sight, p. 162, Note.

Mr. Ware agrees with the Baron in allowing the injury which arises from the discharge of the vitreous humour. He says, “ The translator thinks it much safer to leave these minute fragments” (which may appear after the extraction of the crystalline) “ in the eye, than to hazard the ill consequences which the discharge of the vitreous humour is too apt to produce.” p. 252, Note.

The danger of an escape of the vitreous humour is greatly increased, when this humour, through disease, acquires an unnatural fluidity; or when the posterior part of the capsule of the crystalline is extracted. In the former case, the extraction of the crystalline becomes extremely difficult, as “ all pressure on the ball of the eye must be carefully avoided.” p. 165. Yet with every care “ a considerable portion of the vitreous humour” may be lost. This happened in M. de Pradine’s case, who yet regained his sight: but Mr. Ware’s note on this case deserves attention: “ The operation in this instance proved singularly fortunate. But the translator is of opinion, that it ought not to encourage a sanguine hope of success in similar cases.” p. 173, Note.

With respect to the extraction of the posterior capsule, the Baron urges great caution “ not to touch the mem-

“brane of the vitreous humour,” and gives other cautions, “in order as much as possible to prevent the effusion of the vitreous humour; which, however, it is in many instances extremely difficult to avoid.” p. 264. Mr. Ware “believes it to be utterly impossible to engage and “extract the former” (the posterior part of the capsule,) “without at the same time involving the latter” (the membrane of the vitreous humour).

From all these difficulties the operation of couching is free.

3. “Among the inconveniences to which the iris is liable during the process of this operation” (of extraction,) “I shall take notice of its separation from the choroides in any part of its circumference,—although this accident very rarely occurs.” p. 208. In Madame Patin’s case “the cornea and capsule were scarcely opened, when the iris detached itself, in its inferior and outward lateral portion, to the extent of about a fourth part of its circumference.” p. 209. Whenever this accident occurs, “the crystalline always comes through the artificial opening.” p. 217. which cannot happen without a considerable laceration of the iris. A degree of deformity, at least, must be the consequence of this accident (to which the operation of couching is not liable); but it induces the hazard of a much more serious event, as the Baron acknowledges. For, speaking of the opaque adherent capsule, he says, “If the opaque capsule adheres to the iris, and an attempt to extract it be persisted in, there is danger of separating the iris from its connection at the outer margin, and inducing blindness from this cause.” p. 26, Note.

4. The closure of the pupil is an accident which sometimes follows the extraction of the crystalline. “This closure of the pupil, which is occasioned by the inflammation of the iris, and by the suppuration in which it terminates, has always been considered as the most grievous accident that can possibly take place, after the operation of extraction.” p. 266. For the cure of blindness from this cause, the Baron has pointed out a method

of making an artificial pupil, which, he says, has been attended in some instances with success. But if "the inflammation of the iris terminates in suppuration," what can any operation effect? It is but in some favourable cases that the operation can possibly succeed, as the Baron allows; for, "when the closure of the pupil is occasioned by a violent ophthalmia" (which may be caused by the extraction of the crystalline), "it rarely happens that the organization of the eye is not otherwise so much injured, as to destroy all hopes from any operation." p. 277.

I have already noticed, that the closure of the pupil has never followed any operation of couching which I have performed.

5. I entirely agree with the observation of Baron Wenzel, that "whatever mode of performing the operation may be adopted, and whatever precautions may be used, we must not flatter ourselves that pain and inflammation can always be prevented." But I cannot accede so readily to his assertion, "that inflammation and excessive pain occur much less frequently when the operation is conducted in the manner he has recommended, than when it is performed in any other way." p. 223.

We shall be able to form a just judgment on this subject, by inquiring into the frequency of the worst effects produced by inflammation, in the different methods of operating. We have already pursued this inquiry with respect to some of the consequences of the different operations, and it has hitherto been in favour of the operation by couching: let us now examine the worst consequence that ever attends an attempt to restore sight to persons afflicted with the cataract.

"The most formidable accident that follows the operation of extracting the cataract, is a violent inflammation of the globe of the eye; during the continuance of which, the conjunctiva becomes considerably inflated, and the eye immersed in a large quantity of acrid matter. In consequence of this, the cornea not unfrequently becomes opaque, and purulent matter is collected be-

“hind it; the matter being sometimes found in both chambers of the aqueous humour; and from this cause the patient suffers excessive and incessant pain. If the remedies that are usually directed in cases of inflammation be insufficient to produce an absorption of the matter, which indeed too often happens, the case is hopeless; and the pain will not cease until the suppuration is complete, and the eye sunk and lost.” p. 231.

I admire the candour of the Baron in thus stating what he has seen, and am glad to read the sentence which follows his description of this formidable accident that sometimes attends the operation of extraction. “I am happy to subjoin, that it very seldom occurs in the course of our practice.” p. 232. I am also happy to be able to subjoin, that in my practice it has never yet occurred. The Baron does not make the same declaration with respect to the following accident, which is nearly allied to the former. “Again, a collection of purulent matter is sometimes formed in the eye within a few days after the operation, without any external symptoms of inflammation, and without being preceded by any remarkable sensations of pain.” Ib.

I have seen instances of inflammation, sometimes, though not often, considerable in degree; but in no one instance has the inflammation been attended with, or followed by, a collection of purulent matter or a suppuration of the eye.

Before I committed these observations to the press, I wrote to my late colleague Mr. Lucas, now retired from business, who was surgeon to the General Infirmary at Leeds, from its institution in 1767 to the year 1793, and proposed to him some queries respecting the effects of couching. He favoured me with an answer in the following terms: “I do not recollect, either in public or private practice, having ever seen a suppuration taking place in the eye, the pupil becoming closed and obliterated, or the sight having been destroyed by a succeeding opacity of the cornea, that could be ascribed to the operation of couching.”

I have now considered the objections made by Baron Wenzel to the operation of couching, and also those which he allows to lie against that of extraction. Other objections against the latter, and those of considerable weight, may be found in some modern writers on surgery; but I have thought it the most fair method of canvassing this subject, to confine myself to the facts which are stated in the Baron's Treatise. I have no wish, but that that mode of operating may prevail, which is the most beneficial to the afflicted.



CHAPTER III.

OF THE STRANGULATED HERNIA.

THE *Strangulated Hernia* is a frequent disease, and one which requires great and speedy attention. Persons afflicted with ruptures are numerous. The prolapsed parts are often in a painful and irreducible state for a few hours, and then retire without any bad consequences. On this account patients often permit them to remain in this state much too long without calling in proper assistance.

When a medical person is consulted, the disease is sometimes concealed, either from modesty, or from the pain being less in the rupture than in other parts of the abdomen, which is sometimes the case; the patient having no apprehension that pain at the navel or stomach, with frequent vomiting, can be caused by a small swelling in the groin. This concealment happens the most frequently in the female sex, and is sometimes carried to an extreme; so that I have more than once known the patient deny the existence of the disease. On this account I have made it a rule for many years, always to examine those parts of the abdomen which are the usual seat of a hernia, whenever I am called to a patient labouring under the *Ileus*. For want of this precaution, the strangulated hernia may prove fatal, by being mistaken for a simple ileus. Such mistakes I have known to happen. Indeed, in the femoral hernia the tumour is sometimes so small, and free from external inflammation, or tension of the integuments, that there is danger lest the surgeon, without a careful inquiry into all circumstances, should mistake the rupture for an enlarged inguinal gland.*

* Mr. Elfe found a portion of intestine strangulated in the groin, behind an enlarged gland, in a patient who died the third day of the strangulation.
Med. Obs. & Inq. vol. iv. p. 355.

When the nature of the complaint is clearly ascertained, the danger is often increased by continuing too long the use of those means which are designed to procure a reduction of the strangulated intestine. The complaint is sometimes, indeed, so rapid in its progress, that the patient is scarcely alarmed with his danger before the disease is irremediable. But in all cases, it is of great consequence to make choice of such means, for producing a reduction, as will take effect in a short time, or will soon determine that reduction is impracticable. A strangulated hernia often retires spontaneously, or with the slightest assistance, and sometimes after the disease has continued many days; but if we suffer our expectations to be raised much by such favourable events, we shall often bring on that fatal termination which might otherwise have been prevented.

No mode of treatment has hitherto been discovered, which will *certainly* procure a reduction of the strangulated hernia, without having recourse to the knife. Writers on this disease seem to have considered the treatment which they have recommended, as appropriated to all subjects labouring under the complaint; yet some difference, I think, ought to be made in our manner of treating a patient who is seized with this disease in the full vigour of life, and one debilitated by previous illness, or of a very feeble constitution.

The principal means advised previously to the operation are, bleeding, purgative medicines, purging clysters, opiates, the warm-bath, the cold-bath, the application of cloths dipped in cold water, solutions of crude sal ammoniac, ice, ether evaporated on the part, and the injection of tobacco in fume or decoction; to which must be added the attempts to replace the strangulated part in a posture favourable to reduction. Authors have given us instances of the success of all these means, I have seen each of them succeed. I have seen them all fail. I have seen the strangulated parts retire without the use of any means, and even after the strangulation had continued many days. The recital, therefore, of single cases, in which success was ob-

tained by this or that method, (though not usefefs), does not much advance our knowledge. We want to know the comparative merit of each method, and this it is difficult to obtain. I will give the result of my experience on each of these methods.

Bleeding. The strangulated hernia has been usually considered till of late, as an inflammatory disease, and the use of the lancet has been almost universally adopted. Mr. Pott, who wrote much from his own experience, says, "Perhaps there is no disease affecting the human body in which bleeding is found more eminently and immediately serviceable than in this, and which, therefore, if there are no particular circumstances in the constitution prohibiting it, ought never to be omitted." Pott's Works, vol. ii. p. 68, octavo edition.

Mr. Benjamin Bell gives the same advice. "Blood letting is here a principal remedy. In no disease is it either more indicated from appearances, or affords more relief in reality." Surgery, vol. i. p. 275.

On the contrary Mr. Wilmer of Coventry, who has published some valuable observations on strangulated hernia, is of opinion, that "in these cases, the death of the patient can only be explained by the inverted peristaltic motion immediately lessening the powers of life," and thinks "that large and repeated bleedings must increase the debility, and do much mischief." *Obs. on Hernia*, p. 39. He thinks that bleeding "is extremely unfavourable to the patients recovery," should the operation for reducing the hernia be afterwards performed; and after declaring that "most of the patients who are brought into public hospitals die after this operation," he seems to attribute this want of success to their having been bled copiously. *Ib.* p. 45.

Mr. Alanson of Liverpool coincides with Mr. Wilmer in his opinion of the inutility of bleeding in this disease. He tells us, that bleeding *ad deliquium* had been the constant practice at Liverpool, and adds, "As soon as the

“deliquium happened, the taxis was tried during that stage; but I never saw this method successful, nor do I think bleeding ever of the smallest service in forwarding reduction.” *Ib.* p. 44.

Amidst this contrariety of opinions, what path must the young practitioner pursue? I entertain a favourable idea of all these authors; yet it is impossible that I should think them all to be right in these discordant sentiments. If I may be allowed to judge from my own experience, I must conclude that this matter has been carried to an extreme on both sides. I have seen some cases in which bleeding has been clearly useful. I have seen others in which I judged it to be highly improper. I will relate an instance or two on both sides the question, from which the reader may better comprehend my meaning.

CASE I.

Nov. 24, 1766. I visited in the evening, William Pratt of Bramley, a stout young man, whom I found labouring under a strangulated hernia. The strangulation had subsisted about seven hours, during which time he had drank about half a pint of gin, diluted with water, apprehending his complaint to be the colic. He vomited frequently, and had a full, strong, and frequent pulse. He could scarcely suffer me to handle the tumour, though there was no external appearance of inflammation. There was no tension of the abdomen. I opened a vein in each arm, and took away in a speedy manner, between twenty and twenty-four ounces of blood, while he sat upright in bed. He felt himself immediately relieved; and when I examined the groin, after tying up his arms, the hernia had retired.

CASE II.

Nov. 13th, 1775. William Renton, porter to the General Infirmary at Leeds, arose about two in the morning to assist the chimney sweepers; but became so ill with pain at his stomach, and sickness, that he was obliged to go to bed again at five. He continued all day to complain of much uneasiness at his stomach, and vomited up every thing that he took. I happened to be at the Infirmary in the evening, and visited him. The late Dr. Crowther had prescribed for him a solution of Epsom salt, but it was constantly rejected. Knowing that he was subject to a hernia, I inquired if it was now prolapsed. He seemed at first not to have thought about it; but upon my examination, he acknowledged that it had been down all the day, though he had no pain in the tumour. I ordered him to sit up in bed, while about a pint of blood was drawn by opening a vein in each arm at the same time. He became sick before the evacuation was finished, but had no deliquium. Immediately after the bleeding I placed him in a horizontal position, and tried to reduce the intestine, which now went up very readily, though I had before the bleeding attempted the reduction in vain.

I relate these cases to shew, that there are circumstances in which bleeding may be of use; but I do not mean to impress upon the reader an idea, that a like happy termination will generally attend this evacuation. I know it will not. My own experience leads me to concur so far with Mr. Wilmer and Mr. Alanfon, as to declare, that bleeding has generally failed to procure a reduction of the strangulated intestine, though I am persuaded that in many cases it may be used with advantage. I cannot, however, agree with Mr. Wilmer in thinking, that it generally renders the subsequent operation more dangerous. The following observations induce me to differ from this opinion.

When the operation proves unsuccessful, without gangrene of the prolapsed part, the patient almost always dies with symptoms of the ileus; and this disease (which is an inflammatory affection of the intestines) generally succeeds the operation in some degree, if the patient recovers with difficulty. Though I consider proper purgatives as of greater efficacy than bleeding in the cure of this disease; yet I cannot suppose that it is ever brought on by previous bleeding.

Again, in all the cases which I have seen, where the operation has not succeeded, and where I have had an opportunity of examining the body after death, I have found signs of inflammation in the intestines, or omentum, or both. I have found inflammatory, and even gangrenous affections, at a considerable distance from the part which had been prolapsed. Warner and Le Dran have observed the same appearances. The former, in dissecting the body of a patient who died on the 20th day after the operation, found "the intestines in general greatly inflamed, the ileum mortified in many places, and several abscesses formed in the mesentery." *Cases in Surgery*, ed. 3, p. 197. The latter says, "I have often seen this whole canal inflamed, and marked in several places with gangrenous spots." *Gataker's Translation of Le Dran's Operations*, p. 80.

Purgative Medicines. My experience leads me to condemn almost universally the use of purgatives taken by the mouth, while an intestine remains firmly strangulated. In the entero-epiplocele, when the intestine has retired, and the omentum remains strangulated; or in a simple strangulation of the omentum, where the intestine has not been prolapsed, purgatives are of great utility. So likewise in very large and old hernias, where there is reason to doubt whether the disease is not to be considered as a morbid affection of the intestinal canal, rather than the effect of strangulation, purgatives may be as useful as in the simple ileus without hernia. While the intestine remains firmly strangulated, they usually increase the vo-

miting, and add to the distress of the patient. If they are to be tried at any time with hope of success, the trial would appear to have the greatest advantage when the vomiting has been removed by means of an opiate; yet I have repeatedly given them in vain during such an interval of relief. I once had an opportunity of trying their effect under the most favourable circumstances, while the strangulation remained unabated.

CASE III.

John Handley, aged forty-five years, who had a small irreducible Epiplocele, by making some considerable exertions in lifting a table, caused a sudden increase of the tumour, which was followed by the usual symptoms of strangulation. His pulse was betwixt seventy and eighty. He was directed to take immediately a dose of *ol. ricini*, and afterwards to take *magnes. alb.* ʒss every two hours, drinking a table spoonful of lemon juice after each dose. Cloths dipped in cold water were applied to the tumour. These means afforded no relief. Neither of the medicines would rest upon his stomach. On the second day of the strangulation he was put twice into a warm bath, and had two clysters injected, made with a decoction of a drachm of tobacco boiled in a pint of water for ten minutes. Both the clysters caused great sickness, but did not produce a return of the hernia. At bed time he took fifty drops of *tinct. opii*.

The opiate procured a comfortable night, and the vomiting ceased for forty-eight hours, during which time he took nine table spoonfuls of castor oil, and half a drachm of the *extract. coloc. comp.*, all which medicines were retained upon his stomach. Purgings clysters were also frequently injected during this interval of two days, and the use of the warm bath was repeated.

At the end of the fourth day, from the commencement of the strangulation, the vomiting returned, and continued

all the night. I was called to visit him at six in the morning, and found him vomiting frequently, having the hic-cough, with tension of the abdomen, which had not subsisted before. His pulse was now small and frequent.

I immediately performed the operation, and found a portion of omentum in the hernial sac, enveloping a small portion of intestine, which was of a dark brown colour. The hernia was of the femoral kind. It was with great difficulty that I could introduce the tip of my fore-finger within the neck of the hernial sac, so as to enable me to divide the part which caused the stricture,* with safety. Part of the omentum adhered to the hernial sac, which was thickened where the adhesion took place. I cut off the diseased part of the sac, with the omentum adhering to it. Such part of the omentum as appeared to be quite sound was reduced; but the greater part of it was left in the wound. A small plug of lint was introduced into the orifice.

No medicine was given to him, as so much of the castor oil had staid with him. He had six copious stools, and three smaller ones in the course of the first twenty-four hours. He found great relief from the operation. In the evening he was perfectly easy, and told me, that he had had a *rare day*. The small plug of lint came away, and the diseased part of the omentum was cast off on the seventh day after the operation. He recovered very well.

Purgative Clysters. I cannot say that I have seen one case in which clysters, either made with purgative ingredients, or simply laxative, as broth, or water gruel with oil, have produced a return of a strangulated hernia. Such injections will empty the larger intestines; but they have seemed to me to do no more. It is common for a natural evacuation to be the immediate consequence of strangulation.

Warm Bath. Many instances are upon record of the good effect of warm bathing in procuring the reduction

* This part will be described hereafter.

of a strangulated hernia. I have often seen it useful; but I have also often seen it fail of success. Whenever it is used in this disease, the patient should be placed, if possible, in a horizontal position. Gentle efforts with the hand to reduce the prolapsed part are perhaps attended with less danger, and with greater prospect of success, while the patient lies in the bath, than in any other position. The free use of opiates coincides with that of warm bathing, and, under some circumstances, these means deserve to be tried in conjunction, as was done in the following case.

CASE IV.

February 2d, 1771, I was desired in the evening to visit a poor woman who lived about a mile from Leeds, on account of a vomiting which had afflicted her all the day, attended with violent pain in the abdomen. Upon examination I found that she had a strangulated femoral hernia. Her pulse was not very frequent. The abdomen was painful when compressed, but was not much inflated. She informed me that she had been subject to the rupture for several years, which had been repeatedly strangulated for a short time. She was now violently affected with the cramp. Her fingers were almost continually rigid. She had pain in the abdomen which seemed to arise from spasm, and not from the hernia; for it seized her by paroxysms, during which she cried out, and could not bear to lie upon her back. In short, almost all the external muscles, except those of the face, were affected with spasm. There was reason to believe that this disorder arose from inanition, as she had given suck to a child for two years, and probably had not always enjoyed a plentiful table. She had of late been often troubled with the cramp.

Under these circumstances I thought that opium and the warm bath would afford the most suitable means for promoting the return of the hernia. I ordered a warm bath to be prepared immediately, and directed four draughts,

one containing tinct. thebaic. gr^{ss} xx. and the other three gr^{ss} xv. each: of these she was to take one every two hours. But previously to the use of these means a purging clyster was injected, as she had had no evacuation in the course of the day. She took the draught, with t. theb. gr^{ss} xx. as soon as she came out of the bath, but could not retain it upon her stomach; at least, she had retchings after taking it. The other draughts were not rejected; she became composed, the vomiting ceased, and in the course of the night the hernia retired.

Opiates. I have seen several cases in which opiates given freely (in athletic persons after bleeding) have procured a reduction of a strangulated hernia. I have also received accounts of success by the same means from some of my medical correspondents; but I cannot say that this remedy is generally successful. One circumstance relative to the use of this medicine deserves to be noted, viz. that it will often remove for a time the pain and vomiting, usually attendant upon a strangulation, even where it proves ultimately inefficacious. I have already related one instance in which the vomiting and pain were suspended during forty-eight hours, so that the patient lay easy, and retained upon his stomach every thing that he took, though the strangulation continued. I have seen other instances of persons remaining easy, and free from vomiting, for twenty-four hours, after taking fifty drops of tinctura opii. On this account opium is a valuable remedy, when the patient is so situated, that it is necessary to remove him to a considerable distance before the operation can be performed. Opiates should be given in large doses, when it is intended to try their effect for procuring reduction; and whenever the symptoms of strangulation return, after having been removed by the use of opiates, the operation should be performed without further delay.

Cold stupes, and cold bath. Mr. Wilmer has recommended the former of these means so strongly, that they are now frequently, if not generally, used as the principal remedy for procuring reduction. They had been men-

tioned by former authors,* and I had directed them, before Mr. Wilmer published on the subject. I have used them very frequently, sometimes with evident advantage, but oftener, I am sorry to say, without success. I have no objection to this remedy, as I am not conscious that I ever saw it do harm; but relations of its success after a long continued use should be heard with some caution, as there is danger of deferring the operation, through the continued use of this remedy, till the life of the patient shall be lost by the delay. It would be a more valuable remedy, could we determine the length of time necessary for a sufficient trial of its efficacy, in any particular case, that we might on the one hand avoid a needless operation, and on the other, guard against a fatal delay. I once succeeded in procuring reduction by other means, after the cold stupes had been applied during the whole night, and a great part of the succeeding day, as I shall hereafter relate.

I have seen a single immersion in cold water cause a spontaneous ascent of a strangulated intestine; but this method has also failed of success. I have twice tried the dashing of cold water upon the abdomen and thighs, while the patient stood uncovered, but without success.

Injections of Tobacco. This I consider as one of the most efficacious remedies in the strangulated hernia, previously to the operation; yet truth will not permit me to say, that it is even generally successful. I have, however, seen it succeed when other means have failed, as in the following instances.

CASE V.

November 29, 1779, as I was passing through Rothwell, a village near Leeds, I was desired by a poor woman to visit her son, a boy of thirteen years, who had lain about

* Medical Essays (of Edinburgh) vol. v. 232.

forty-eight hours ill with a strangulated scrotal hernia. He vomited every thing which he drank, and had much pain in the belly, which, however, was not greatly inflated. His pulse was at ninety-four, and rather tense. The tumour would not bear handling without exciting much pain; but the integuments retained their natural colour. I placed him in an upright posture, while I took about six ounces of blood from him; and that the evacuation might be the more speedy, I opened a vein in each arm. He complained of sickness, but did not faint. The hernia still remaining, I suspended him by the lower extremities over the shoulders of an assistant, and attempted the reduction in this position, applying to the tumour at the same time cloths dipped in cold water. This method also failed of success. I then placed him in bed, and continued the application of the cold wet cloths till the lower part of the tumour felt cold. The hernia was not reduced by any of these means. I then injected a clyster, made by boiling for a short time half a quarter of an ounce of tobacco in half a pint of water. The clyster had not been injected ten minutes before the boy began to complain of being very sick, and had some retching. I now attempted again to reduce the hernia, and succeeded with great ease.

CASE VI.

In the summer 1782, Samuel Edge, aged forty years, was admitted an in-patient of the General Infirmary at Leeds, on account of an ascites and universal anasarca. He had been afflicted with an asthma many years, but the dropsy had not come on till the preceding winter. First one, and then the other, of his legs began to swell. Afterwards his abdomen became enlarged. In the absence of his physician I directed him to take three grains of powdered squill, mixed with a little pulv. e tragac. c., three or four times a day, as his stomach would bear it. The medicine agreed with him, and the dose was increased till he took eight grains of the squill five or six times a

day. He continued to take it in this dose about sixteen days, excepting two, on which the dose was diminished on account of its proving too laxative. The diuretic effect was considerable, and both the ascites and anasarca were completely removed.

This poor man was subject to a hernia, which by his cough was rendered very troublesome. Before he was dismissed from the Infirmary, the hernia became strangulated, in which state it had been two days, before I was informed of the complaint. He complained of pain in the abdomen, and had a vomiting. The house apothecary, not being informed, as I should suppose, of the hernia, had given him a gentle emetic, and afterwards a laxative medicine. As he had had some evacuation by stool on the day on which I first saw him, though the hernia could not be reduced by gentle pressure, I only directed an opiate, small doses of cathartic salt, and the application of cold water to the tumour.

The next day I found him worse. The cathartic salt had been rejected. He had taken three grains of opium, and had applied cloths dipped in cold water during the whole of the night, and part of two days. Though a large evacuation of blood was undoubtedly forbidden by the previous weakness of this patient, yet I ventured to take about six ounces from his arm,* and then injected a clyster of the decoction of tobacco, made by boiling a drachm of the cut leaves for ten minutes in a pint of water.† Within fifteen minutes after this clyster was given, he informed me that he felt a *sudden degree of ease* in his belly. I immediately attempted to reduce the intestine, and it receded with ease.

A truss was immediately applied, and the man had no more complaint.

* In a similar case, I should now omit the bleeding.

† Wherever a clyster of the decoction of tobacco is mentioned in these observations, it must be understood to be made after this formula, unless otherwise specified.

I have frequently injected the *fume* of tobacco in the strangulated hernia, but am inclined to prefer the *decoc-tion*. I wish I could say, that this has not often failed, like every other means which I have tried. I think, however, I may venture to say, that no method has succeeded so often; and that I have scarcely ever seen any other remedy succeed, without the operation, when this had failed of procuring an evident diminution, at least, of the tumour. One thing must be allowed in favour of this remedy, that it discovers in a shorter time than any other, whether there is a probability of obtaining a reduction of the hernia without the operation. I have usually thought one trial of this remedy to be sufficient; but have scarcely ever directed more than one repetition. When this has failed of success, the operation has discovered such a state of the strangulated parts, as to satisfy me, that no hope of advantage remained from a longer delay.

I have taken no notice of poultices, or partial warm fomentations. The efficacy of these means seems almost universally to be doubted, if not denied, by those who have had much experience in the treatment of this complaint.

The selection of the various remedies above mentioned must be left to the judgment of the practitioner, who should be guided, in some measure, by the different circumstances of each case. But I can scarcely press in too strong terms the necessity of an early recourse to the operation, as the most effectual method of preserving life in this dangerous disease. If Mr. Pott's opinion be true, that the operation, when performed in a proper manner, and in due time, does not prove the cause of death oftener than perhaps once in fifty times; it would undoubtedly preserve the lives of many to perform it almost as soon as the disease commenced, without increasing the danger by spending much time in the use of means, which cannot be depended upon for a cure.

I have twice seen this disease prove fatal in about twenty-four hours.* In such cases it is evident there is little time for delay. A surgeon, who is competent to perform the operation, is not perhaps consulted till the intestine is on the point of being mortified, or is actually in a state of mortification. The dilemma into which he is then cast is painful indeed. But when the fullest opportunity is afforded him of using the best mode of treatment, I am satisfied that his success will be the greatest when the operation is not long delayed. This, at least, has been my own experience. When I first entered upon the profession of surgery, in the year 1759, the operation for the strangulated hernia had not been performed by any of the surgeons in Leeds. My seniors in the profession were very kind in affording me their assistance, or calling me into consultation when such cases occurred; but we considered the operation as the last resource, and as improper until the danger appeared imminent. By this dilatory mode of practice I lost three patients in five upon whom the operation was performed. Having more experience of the urgency of the disease, I made it my custom, when called to a patient who had laboured two or three days under the disease, to wait only about two hours, that I might try the effect of bleeding, (if this evacuation was not forbidden by some peculiar circumstances of the case), and the tobacco clyster. In this mode of practice I lost about two patients in nine upon whom I operated. This comparison is drawn from cases nearly similar, leaving out

* In one of these cases I made use of no means, as I did not see the patient till about half an hour before his death. In the other case, the patient, though a young man, died immediately after the operation. But this was a complicated case. On the preceding day the hernia had received a blow from a shovel, which produced the strangulation, and an inflamed state of the parts. His pulse was very frequent. Twelve ounces of blood were taken from his arm. A tobacco-clyster was injected; and cold stupes were applied to the tumour, which was in a very tense state. But he sunk rapidly. He was restless, and rather delirious during the operation, which was performed as the only means which then afforded the least hope of preserving his life; but he expired, as soon as it was finished, in the act of vomiting.

of the account those cases in which a gangrene of the intestine had taken place.

I have now, at the time of writing this, performed the operation thirty-five times;* and have often had occasion to lament that I had performed it too late, but never that I had performed it too soon. There are some cases so urgent, that it is not adviseable to lose any time in the trial of means to produce a reduction. The delay of a few hours may cut off all hope of success, when a speedy operation might have saved the life of the patient.†

I am persuaded, that much harm has been done by long continued efforts to replace the strangulated intestine. The patient, who has been accustomed to reduce his own hernia, will perform the operation of the taxis with the greatest safety. If he fails, the surgeon should be cautious of doing much. Suspension over the shoulders of an assistant or two has been thought to favour the reduction considerably. I have tried it often; but have not found it to be of such superior efficacy as some authors have represented. When the strangulation ceases, the hernia often retires spontaneously, or with the slightest efforts, if the patient is in a horizontal position.

In describing the operation for the strangulated hernia, I shall omit those directions which are mentioned by almost all writers on the operations of surgery, and confine my

* Since the beginning of the year 1794, my son, who is now my partner in business, has generally performed the operation in my private practice. These cases are not reckoned in the number here specified.

† However urgent be the case, I should not advise the operation to be performed during the sickness and languor which usually follow the injection of a decoction of tobacco. The operator ought, in my opinion, to wait till the patient is free from the debilitating effects of that remedy.

remarks to those, which either have not been mentioned, or which deserve a particular attention.

In the scrotal hernia the incision ought to begin a little above the abdominal ring, otherwise the surgeon will be under the necessity of enlarging the incision, or will be hindered by the integuments when he attempts to divide the ring.

The incision ought to be continued through the scrotum as far as the lowest part of the hernial sac. For since the vessels and nerves, which constitute the spermatic chord, are sometimes so far displaced and separated by the hernia, that one, or more of them, have been found lying upon the anterior part of the sac; they can neither be discovered, nor avoided, unless the scrotum be divided previously to the division of the hernial sac. Le Dran says, "I have seen, though but once only, the spermatic chord situated anteriorly upon the hernial sac."* I have twice seen the vas deferens lying upon the anterior surface of the hernial sac. In one patient, an old man betwixt sixty and seventy, it lay before the lower part of the sac only; and when I had finished the operation, I found that I had divided it, by making the incision through the lower part of the scrotum and hernial sac at the same time; which I had done to avoid giving the pain of two incisions. Since that time, I have always divided the scrotum intirely before I cut through the sac.

The opening of the hernial sac should be made with great caution. There is sometimes, indeed, such a quantity of fluid in the sac, that no harm would ensue from an unguarded perpendicular incision; but I have often seen the intestine and omentum in contact with the sac, so as to render such an incision dangerous. The best method is, to dissect very cautiously the most prominent part of the hernial sac, for about an inch in length, dividing the layers of aponeurotic substance, if there be any, with the intervention of a small director; and then to cut the remaining part of the hernial sac with the edge of the knife turned horizontal-

* Gataker's Translation of Le Dran's Operations, p. 95.

ly, having elevated what you are about to cut with the dissecting forceps. By this method the sac may always be opened without danger.

As soon as the sac is opened, which is usually indicated by the issuing of a thin fluid, and the orifice is sufficiently enlarged to admit the finger, the remainder of the sac may be divided by the curved bubonocoele knife. But I would advise the operator to avoid carrying his incision quite to the inferior extremity of the sac, in the scrotal hernia. This is so connected with the tunica vaginalis, that the latter is in danger of being divided, if the incision is carried on to the extremity of the sac. I have seen this happen, and therefore commonly leave a quarter or half an inch of the sac undivided, which practice I never saw attended with any inconvenience.

The next step is to enlarge the aperture through which the prolapsed parts have descended from the abdomen, by dividing the aponeurosis of the external oblique muscle, together with the neck of the hernial sac, which sometimes produces the principal part of the stricture. If the tip of the fore-finger can be sufficiently introduced to conduct the bubonocoele knife, the division may be made in this way with the greatest advantage. It should be made upwards and a little outwards, when the hernia descends through the abdominal ring; and in this species of hernia I have never found any difficulty in executing this part of the operation.

The division of the *femoral ring* (if I may be allowed the expression) is a matter of greater importance, and merits a particular discussion. In the male subject both the epigastric artery, and the spermatic chord, lie so near the aponeurotic border of the external oblique muscle of the abdomen, called Poupart's ligament, that there is great danger of wounding the one or the other of these, if that ligament is divided in this operation. In females, the epigastric artery alone requires our attention.

To avoid the danger arising from a division of that ligament, Mr. Benjamin Bell has invented a new method

of operating in the femoral hernia, which he has described at large in his *System of Surgery*, vol. i. p. 363. I shall not enter upon an examination of this method, as I am satisfied that the stricture, in this species of hernia, is not caused by Poupart's ligament, but by another part, which I shall presently describe, the division of which may be executed without danger to the spermatic or epigastric artery.

Mr. Pott was so apprehensive of the danger of dividing Poupart's ligament, that, in his *Treatise on Ruptures*, he rather shrinks from the discussion; advising the surgeon to reduce the prolapsed parts without any division, "which," he says, "may almost always be done, considering the large space between the os ilion and the os pubis, and that that space is occupied principally by "cellular membrane and fat."* In his *Section on the Femoral Hernia*, he repeatedly takes notice of this "considerable space between the os ilium and the os pubis," mentioning it not only as the reason why a strangulated hernia may be "returned without dividing the tendon," but also as accounting for the less frequent strangulation of the femoral hernia. These declarations surprise me exceedingly, coming from the pen of an author, who wrote so much from his own experience, as I apprehend Mr. Pott to have done. If we look at the skeleton, we shall undoubtedly see a considerable space between the os ileum and the os pubis; but if we take our ideas from a subject labouring under a strangulated femoral hernia, we shall rather wonder, from the smallness of the aperture, how a descent could have happened. I have now performed the operation for the femoral hernia fourteen times in the female, and twice in the male subject, and have always found great difficulty in introducing the smallest portion of my fore-finger into the femoral ring, for the purpose of conducting the bubonocoele knife. Nay, this introduction I have twice found impracticable, and have been under the necessity of making use of a director. In no

* Pott's Works, octavo ed. vol. ii. p. 138.

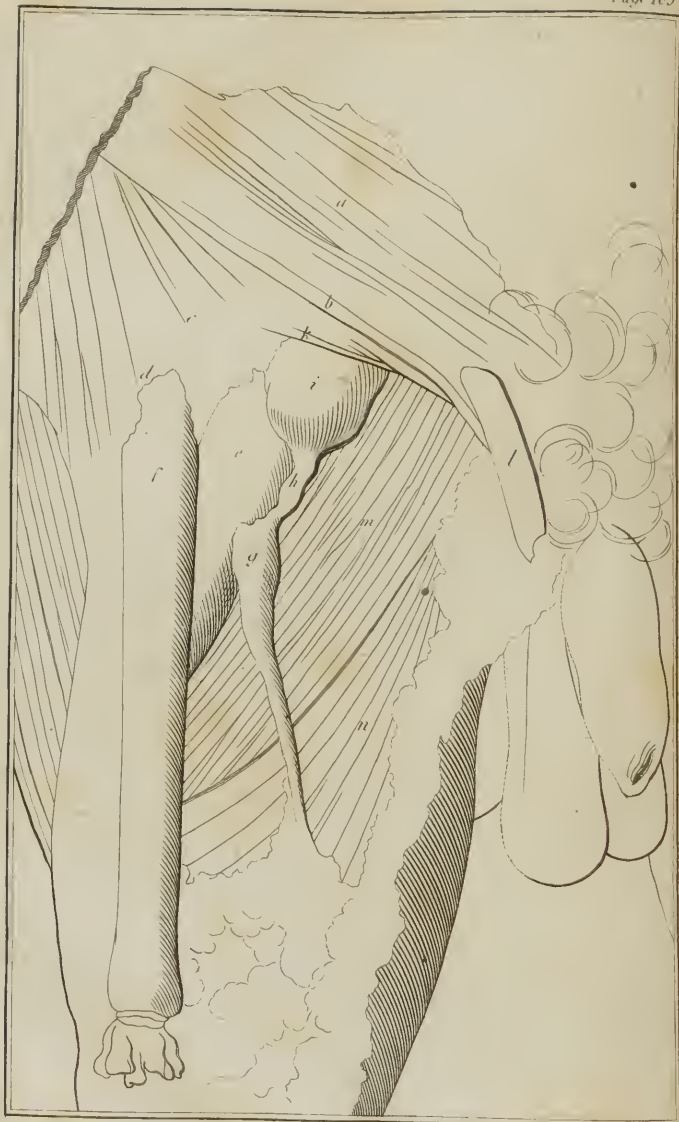
case in which I have operated, did there appear the least probability of reducing the prolapsed parts without previously enlarging the aperture.

Don Antonio de Gimbernat, surgeon to the king of Spain, is the only author with whose works I am acquainted, who has asserted, that the strangulation in the femoral hernia is not caused by Poupart's ligament. He informs us,* that he first demonstrated this in 1768, and afterwards in 1777 explained the subject to the late Dr. Hunter, by means of an anatomical preparation. His treatise induced me to examine repeatedly the parts concerned in the formation of the femoral hernia, and to procure drawings of the parts which I had dissected. The most instructive of these drawings, which was made by Mr. Ruffel, member of the Royal Academy, is here presented to the reader, engraved in a reduced form, in the annexed Plate.

In the *femoral hernia* the prolapsed parts descend within the aponeurotic sheath, which envelopes the great vessels of the thigh, and which is strongly attached at its superior part to the ossa pubis. The anterior layer of this sheath is formed, in part, by a continuation of the fascia of the abdominal muscles, passing down upon the thigh. About three-eighths of an inch below Poupart's ligament, there exists in this aponeurotic sheath another ligament, somewhat similar to that of Poupart, but smaller. It runs transversely, but does not descend obliquely, as that ligament does. On the contrary, it rather ascends as it approaches the symphysis of the ossa pubis, passing behind, and decussating, the extremity of Poupart's ligament. As I shall have occasion to mention this ligament frequently, I shall, by way of distinction, call it the *femoral ligament*.

This ligament is not situated in the same plane with that of Poupart, but lies deeper, that is, at a greater distance from the integuments, though it is represented in the

* In his *New Method of operating for the Femoral Hernia*, translated by Dr. Beddoes, p. 30.



Engraved for J. Humphreys

Blanner 1.



B. Tanner sc

Engrav'd for J. Humphreys

plate as nearly in the same plane, from being pushed outwards by a finger thrust down behind it, while the drawing was taken, that it might be brought more distinctly into view.

DESCRIPTION OF THE PLATE.

a. The aponeurosis covering the inferior part of the external oblique muscle of the abdomen.

b. Poupart's (or the *abdominal*) ligament.

c. The fascia of the thigh cut off at

d d, to shew the great vessels injected with wax.

e. The femoral vein.

f. The femoral artery.

g. The vena saphæna, not filled with injection, except at its upper part, where it enters the femoral vein.

h. A small portion of the aponeurotic sheath of the great vessels, left when the anterior part was removed along with the fascia of the thigh.

i. The peritoneum thrust down below the *femoral ligament*, by a finger introduced from within the abdomen, to give some representation of the femoral hernia.

k. The *femoral ligament*, formed in the fascia of the thigh or anterior layer of the aponeurotic sheath of the great femoral vessels.

l. The spermatic chord.

m. The pectinæus muscle.

n. The adductor longus femoris.

The fascia of these two muscles was dissected off to shew the course of their fibres. It is thin, and is not a continuation of that fascia which unites with the aponeurotic sheath of the great vessels. This sheath lies upon the outer edge of the pectinæus muscle, and is connected with

it merely by cellular membrane; so that a finger may be pushed with ease between the sheath and that muscle.

That part of the fascia of the thigh, to which I have given the name of *femoral ligament*, may easily be discovered, by introducing the finger (after the abdomen has been laid open) into the aponeurotic sheath of the great femoral vessels, behind Poupart's ligament. As the finger passes downwards, it will be pressed upon by a part of the fascia, more compact than the rest, which runs transversely about three-eighths of an inch below Poupart's ligament, and sometimes presents a sharp edge to the finger. When this is examined by dissection, it will be found to resemble the inferior border of the aponeurosis of the external oblique muscle of the abdomen. In those subjects, which I have dissected on purpose, I have not found it equally distinct; but it has been in all of them, sufficiently apparent. In this examination one may perceive, that a prolapsed intestine would receive very little pressure from Poupart's ligament, in comparison of that which it must suffer from this inferior ligament, the structure and situation of which account clearly for the peculiar phenomena of the *femoral hernia*.

The femoral hernia is usually of a rounder form, and less bulk when strangulated, than the scrotal hernia. I have repeatedly seen it resembling an enlarged inguinal gland.

It is not so frequent in males as in females. In the latter I have rarely met with a descent of the intestine through the abdominal ring. In all the instances of strangulated intestinal hernia in females which have occurred in my practice, the hernia was of the femoral kind.

In performing the operation for the strangulated femoral hernia, the surgeon ought to be aware, that the hernial sac is usually thinner than in the scrotal hernia. After a division of the integuments, the sac ought therefore to be opened with great caution. The stricture made upon the prolapsed parts is very great, as I have already observed;

but if the tip of the finger can be introduced within the femoral ring, to guide the bubonocoele knife, a small incision (for the ring is narrow) will be sufficient to set the parts at liberty. If the tip of the finger cannot be introduced at the proper place, a director with a deep groove must be used instead of the finger; but I prefer the latter. The finger or director should not be introduced very near the great vessels; but on that side of the intestine or omentum which is nearest to the symphysis of the ossa pubis. The incision may then be made directly upwards. The surgeon must take especial care to introduce his finger or director within that part where he finds the stricture to be the greatest, which, in this species of hernia, is the most interior part of the wound. The difficulty of executing this part of the operation should not induce the surgeon to divide any part which is of more easy access. It is much more easy to divide the *abdominal* (Poupart's) than the *femoral* ligament; but it is the division of the latter only that will set the prolapsed parts at liberty. The aponeurosis, which lies between the abdominal and femoral ligaments, is yielding, and will not, usually, I believe, prevent the reduction of the intestine, when the femoral ligament is divided. I had repeatedly wondered, that, in this operation, so small a division of the most interior and contracted part should prove sufficient for the reduction. But, since I have discovered the situation and structure of the femoral ring, my wonder has ceased. I had, from experience, gained a knowledge of the proper manner of performing this operation, before I had acquired, from anatomical investigations, a just idea of the part which principally causes the strangulation. I had presumed (as I suppose every other surgeon did) that I was dividing Poupart's ligament when I removed the stricture; but I knew practically, that a small division of the most interior part usually proved sufficient. It has been my custom to take notes of the circumstances which occurred in operations for the strangulated hernia. An extract from some, which I made in 1784, may afford a confirmation of the opinion which I now entertain, respecting the strangulation

of the femoral hernia, though the observation was anatomically erroneous.

I was operating upon a woman, aged sixty-six, on account of a femoral hernia, which had been strangulated three days. The hernia was an entero-epiplocele. "Poupart's ligament," I observed, "pressed the intestine closely, as usual. After dividing it, some of the sound intestine slipped out of the abdomen, which I could not reduce. The aponeurosis (forming Poupart's ligament) consisted of two layers, which were separated considerably from each other. When I attempted to reduce the intestine, it passed into the cavity formed between these layers, and not into the abdomen. I made a farther division of the internal layer, and the intestine was then reduced with ease, and remained in the abdomen."

I apprehend that, in this case, the space between the abdominal and femoral ligament was rather greater than usual. I remember that the aponeurosis, which lies between and connects them, yielded considerably to my pressure. As a portion of intestine, which had not been strangulated, descended upon the division of Poupart's ligament, it shews, that some pressure is made upon a femoral hernia by that ligament; but my inability of reducing the prolapsed intestine, without dividing another, and interior part, shews, that the stricture, causing the strangulation, was made by that part, and not by Poupart's ligament.

With respect to a division of the spermatic and epigastric arteries in this operation I will relate all that has occurred in my own practice. No hæmorrhage took place in either of the operations, which I performed for the femoral hernia in males. I may be allowed, therefore, to say that the spermatic artery was not divided in either case. The following case is the only one in which I wounded any vessel of consequence, while dividing the part which formed the stricture. The accident occurred in the early part of my practice, before I was aware how small an in-

cision was necessary for removing the strangulation in the femoral hernia.

CASE VII.

IN 1764 I was operating upon an old woman for a femoral hernia, and attending chiefly to the convenience of introducing the tip of my fore-finger, I made the division of the ring directly upwards, and not on that side of the intestine which was most distant from the femoral artery. The incision was also longer than I now judge to be necessary; for, in my notes made soon after the operation, I stated, that I judged the incision through the aponeurosis to have been about half an inch in length. The consequence was, that I opened an artery, which bled freely, but of which, neither I nor the gentlemen who assisted me at the operation, could discover the orifice. Mr. Samuel Sharp supposed it to be an easy matter to take up with a needle any vessel which might be wounded in this operation; but this I found to be impracticable. I applied a small piece of dry sponge upon that part whence the blood issued, and upon this I placed several other pieces, till I had raised them so high, that the common bandage would make a compression on the bleeding part. During the first day after the operation, an assistant was directed to keep a constant pressure with the hand upon the pieces of sponge. The hæmorrhage ceased by this method, and did not return. I began to remove the exterior pieces of sponge after a few days, and gradually insinuated some lint under that piece which lay in contact with the wound. On the 14th day after the operation, I removed the last piece of sponge.—The wound was cicatrized at the expiration of five weeks.

The third stage in this operation consists in the disposal of the prolapsed parts. Here several important considerations present themselves, chiefly relating to the management of the omentum.

After unfolding the omentum, in the entero-epiplocele, I separate it from the intestine, and also the folds of intestine from each other, if they have contracted an adhesion, by gently drawing them asunder. This adhesion I have often seen; but, I think, have always been able to effect a separation of the adhering parts without the assistance of any instrument, and without injuring the intestine, if a gangrene had not taken place.* I always reduce the intestine, if it is in a sound state before the reduction of the omentum, which is contrary to the practice recommended by Mr. Pott. My reason for acting thus is an opinion, that the intestine will bear a protracted pressure, without injury, better than the omentum. When there is a necessity for cutting off a portion of omentum, or separating it from the hernial sac, or taking up any of its divided vessels; these operations may be executed with greater safety after the reduction of the intestine.

I once saw the coats of the intestine so thickened in a scrotal hernia, that it resembled a lump of muscular flesh, rather than a portion of intestine. I was obliged in this case to make a large division of the abdominal ring before I could effect the reduction; and even then the intestine was not reduced without difficulty. After several ineffectual attempts I succeeded by the following method: I stood with my right side to the left of the patient; then placing my fingers round the extremity of the intestine, and directing them upwards behind it, I gently pushed up the highest part of the intestine, while the palm of my hand supported the most depending part. This method I have found useful in several cases where reduction was difficult.

I must refer my readers to the works of other authors for an account of the treatment of the intestine, when it is found in a gangrenous state. I have seen several such ca-

* I do not mean to speak in this place of an adhesion of the omentum to the hernial sac; in which case a separation can seldom be effected without the assistance of the knife.

ses, but the termination of them in general was fatal, and I have little to say upon the treatment of them from my own experience.*

I will relate the particulars of two cases, and will add a conjecture, which may account for some of the recoveries related by authors, in cases where a prolapsed intestine was gangrened.

CASE VIII.

In July 1767, a labouring man, aged thirty-eight years, was seized with a pain in the scrotum and lower belly, after having exerted himself in lifting hay with a fork. He did not immediately examine the scrotum; but in the morning upon waking, he found the right side of it swelled, inflamed, and painful, especially upon motion. He sent for a surgeon, who bled him, gave him laxative medicines, and applied a mild poultice to the inflamed part. On the eighteenth day of the disease I was desired to visit him. His bowels had been opened by the laxative medicines. He had also taken some powders with crystals of tartar and nitre, and an opiate at bed time, without which he could not sleep. The scrotum continued swelled, and the inflammation extended over the integuments upon the right side of the hypogastrium. His pulse was rather tense, and beat about ninety strokes in a minute. I advised a repetition of the bleeding and cooling medicines, with the opiate at bed time. On the twentieth day, the tumour was more prominent a little below the abdominal ring. On the twenty-first it burst, and discharged purulent matter mixed with fæces. Several orifices were formed in the scro-

* I have seen but four cases, in which a patient has recovered after a gangrene in a strangulated hernia. Two of the cases are related in this place; the third was the case of Moses Bradford, related hereafter, where the gangrene did not shew itself till the fifth day after the operation; the fourth was the case of an old lady who had a small gangrene in an irreducible exomphalos,

tum; and in the course of a few days, the lowest of them became enlarged to about the breadth of a six-pence, by the sloughing of the scrotum. Upon pressing the hypogastrium, stercoraceous matter, mixed with air, issued out through the scrotum. Little or no doubt now remained, that the tumour of the scrotum was formed by a hernia of the intestine, which had burst in several places. This idea was confirmed by the subsequent detachment of a portion of intestine, about an inch and a half in length, and of considerable firmness. Upon washing the part cast off, I could discern its villous coat. The wound was soon filled with granulated flesh, the discharge of fæces ceased, and a complete cicatrization took place in the course of two or three weeks, as I was informed; for I did not visit the man after the wound was so far healed as to discharge no more fæces.

CASE IX.

September 25th, 1801, Caleb Breaks of Wibsey, aged forty, was admitted into the General Infirmary with a strangulated femoral hernia on the right side. During the last five or six years he had been accustomed to an occasional descent in this part; but had always been able, before this time, to reduce the hernia. He perceived the swelling as he was walking on the 23d instant, and being unable to reduce it as heretofore, and feeling much pain in the affected part, he consulted a surgeon, who used considerable efforts to effect the reduction.

Mr. Logan, in my absence, visited this patient for me at his admission, and found the hernia in a tender and somewhat inflamed state. He directed a clyster to be injected, made with the decoction of tobacco, and the frequent application of cloths dipped in cold water.

I saw the patient at ten in the evening. He was then under the influence of the tobacco clyster. He complained of sickness, had frequent eructations, and some degree of cold perspiration. His pulse, which had been at a hun-

dred and twelve at his admission, was now reduced to fifty-eight. The abdomen was somewhat inflated. His tongue was white. The inflamed appearance of the hernia was, according to my information, rather abated.

As he had rejected nothing which he had taken since the commencement of the strangulation, and as he had had an evacuation by stool, there was reason to think, that the course of the *fæces* through the intestinal canal was not interrupted. It was judged proper, therefore, to try the effect of purgative medicines for removing the inflation of the abdomen and inflamed state of the hernia. I directed pulv. jalap. \mathfrak{z} j. calomel. gr. v. to be given, in the form of pills, every three or four hours, till three doses should have been taken, unless a free evacuation should in the mean time take place. A purging clyster was also ordered to be injected after the second dose of the pills. The application of the cold cloths was directed to be continued.

26th, seven A. M. He had had a copious evacuation after the clyster, and felt himself much relieved. The inflation of the abdomen had entirely subsided; but the integuments appeared inflamed to the distance of two or three inches from the tumour, which was round and small. I directed the application of a warm poultice of bread and water,* instead of the cold cloths, and the injection of another clyster at noon. Pulse ninety-four.

Six P. M. The patient had not been relieved by the clyster, which returned without *fæces*. The abdomen was again a little inflated, and the pulse was at a hundred. I ordered ol. ricini \mathfrak{z} ss. to be given every four hours till a stool should be procured.

27th, nine A. M. He had had a stool in the evening soon after my last visit, and another before ten, on which

* The application directed in this case may seem inconsistent with what I have said, p. 96, on the inutility of poultices in the strangulated hernia. But they were now applied to abate the inflammation of the integuments (in a case which appeared, at that time, to be a mere strangulation of the omentum), and they were useful for that purpose.

account he had taken only one dose of the *ol. ricini*. I found him easy. Pulse at ninety. Abdomen quite flat. Inflammation of the integuments near the hernia subsided.

He continued to be open in his bowels, and the inflation of the abdomen did not return; but after a few days the tumour formed by the hernia began to enlarge, and this increase of bulk was attended with some degree of fever.

October 2d. The integuments being now rendered thin by the formation of matter in the tumour, I divided them in a crucial form, and discharged a dark coloured, and very offensive matter, mixed with air. There was a small portion of intestine in a gangrenous state, though still inflated with air, and some remains of omentum, which had chiefly become dissolved by putrefaction and suppuration. The cavity containing the matter was much enlarged, and membranous partitions were formed in two or three places. These were all divided, and the wound was dressed as a common abscess.

3d. The poor man was much relieved by the opening made yesterday. His pulse was at eighty-eight. The contents of the cavity were yet black, and extremely fetid. The intestine had become flaccid. A fermenting cataplasm was applied for a day or two.

Some yellow slimy matter appeared now and then in the wound, and had the smell of intestinal fæces; but there was no other appearance of fæcal matter.

7th. The mortified part of the intestine, and the small remains of omentum, were entirely cast off, and the surface of the sore was covered with good granulations.

The patient recovered very well, and the wound was completely cicatrized without any remains of the hernia.

From all the circumstances of these cases, there is little reason to doubt, that the prolapsed portion of intestine was the head of the colon. A similar case is described, and completely illustrated, in the *Medical Observations and Inquiries*, vol. iii. article 8th. The patient, who was the subject of this case, had a scrotal hernia on the right side,

which, upon being strangulated, and neglected, was brought into a state of gangrene. A portion of intestine was cut off by the surgeon, who then visited the poor man, and the fæces passed through the wound for some time. A complete cure was, however, obtained, and the man lived twenty-five years afterwards, without any return of the hernia. After his death the parts were examined, when the caput coli and appendicula vermiformis were only found wanting. The remaining extremity of the colon adhered to the abdominal ring, and afforded no obstruction to the passage of the fæces.

Upon comparing these cases, and considering the extreme danger that attends a gangrene of any part of the intestinal canal through which the fæces must pass, I am induced to conjecture, that many recoveries, after a gangrene of the intestine, may have been owing to the same cause which preserved the life of the patients mentioned above. It is remarkable, that authors who have related the cases of patients, whose prolapsed intestine was gangrened, have generally neglected to relate on which side of the body the disease subsisted. My suspicion is not, indeed, confirmed by this neglect; neither is it refuted by it. Future observations may shew, how far the circumstance I have mentioned may be considered as a cause of recovery in hernia with a gangrene of the intestine.

The proper treatment of the omentum appears to me to be one of the most important parts of this operation. If the omentum is sound, and without adhesion to the hernial sac, it ought undoubtedly to be replaced within the abdomen; but the reduction should be made with the greatest delicacy, as the tender texture of the omentum makes it liable to be bruised with very little force; and slight injuries of this part will bring on inflammation and gangrene. Too much caution cannot be used when a large portion of it is prolapsed.

Mr. Pott recommends the reduction of the omentum in all cases. If it adhered to the hernial sac, his practice was “either to dissect its adhesions, or to retrench a part

“of it.” Vol. ii. p. 107. If it was gangrened, he “always made the excision in the sound part.” He adds, that “any portion of the caul, which it may be thought necessary to remove, may safely be cut off.” Ib. 118, 119. Notwithstanding this great authority, I have always been apprehensive, that wounds of the omentum were not so harmless, as they are here represented to be. My experience has not removed these apprehensions. But I will lay before the reader the result of my experience, and leave him to determine which mode of practice is the most eligible.

When the portion of omentum, which is prolapsed, is in a sound state, of little bulk, and strongly adherent to the hernial sac; and when, from inquiries made of the patient, we learn, that this small part has been prolapsed for many years, without disturbing the functions of the abdominal viscera; we may fairly conclude, that we shall not injure those functions by leaving such a portion in its prolapsed state. In such a case I have suffered the omentum to remain, and have found no difficulty in healing the wound, nor any injury afterwards from the application of a well adapted truss. In one patient I left a portion which I judged to be about two ounces avoirdupois in weight, which was the largest portion that I have suffered to remain. The wound was healed at the expiration of six weeks after the operation. The pad of the truss, which was afterwards applied, consisted of an oval ring, made exactly to the shape of the remaining tumour. This kind of truss sat easy upon the patient, and I suppose answered very well, as I have heard nothing from him to the contrary, though it was applied in the year 1772. He lived about thirty miles from Leeds; but the operation was performed upon him at a small alehouse betwixt Leeds and Wakefield, where he was seized with the strangulation as he was travelling.

The first instance in which I deviated from this mode of practice was in the year 1789. I did it on the authority of Mr. Pott, being desirous of trying the comparative

merits of these two different modes of practice. The case terminated fatally; and as it contains several circumstances worthy of notice, I shall give it at large, that the experienced reader may be better enabled to judge, whether the reduction of the omentum contributed to the fatal event.

CASE X.

February 1st, 1789. I was called in the afternoon to visit Robert Walker, a poor man, aged thirty-seven, who was in great pain from a strangulated hernia. He had been subject to the hernia for many years. It had several times been strangulated for a few hours, according to his account, and could never be entirely replaced within the abdomen. The strangulation at this time had commenced the preceding evening at eight o'clock, soon after which he had a stool, but afterwards had no evacuation. He vomited sometimes, and had a little hiccough. His belly was somewhat tense, but not much inflated. His tongue rather white. His pulse soft and calm, at sixty-four. The lower part of the tumour in the scrotum was soft; the upper part was hard. The scrotum was so thin, that I could feel the omentum within the hernial sac.

I ordered a clyster, made with two drachms of tobacco boiled in a pint of water for ten minutes, to be injected; and cloths dipped in cold water to be assiduously applied. I did not bleed him as his pulse was so soft and calm. The clyster had a powerful effect, producing great sickness and vomiting, with a cold sweat, during which the pulse sunk to fifty-six. I attempted during this languor to reduce the hernia, but in vain; not the least motion was produced by my attempts.

I now strongly recommended the operation, and advised the poor man to go into the Infirmary, as the accommodations of his own house were very bad. My advice did not prevail, so I gave him in the evening fifty drops of

tinct. opii, which entirely removed his pain and vomiting. The next day the poor man consented to go into the Infirmary, but not till towards evening. The pain had now returned, the abdomen was more inflated, and tense, and the tumour was larger. The operation was immediately performed.

Not the least quantity of fluid issued out when the hernial sac was opened. A large portion of omentum, and a smaller of intestine, were the contents. The former appeared to have lain a considerable time in the hernial sac; for it not only adhered to the sac in many places, but also had formed in it several small pouches, in which it lay depressed beyond the general level of the sac. The intestine was dark coloured, but had contracted no adhesion. The stricture was not formed by the abdominal ring, but entirely by the neck of the hernial sac, into which I could not introduce the least portion of my finger.

I was obliged to divide the ring pretty high, that I might with safety divide the neck of the sac; and this last division was effected by cutting along the groove of a director, till I had made a sufficient aperture for the introduction of my finger. As the omentum adhered to the sac by little cords, which might easily be divided, I separated it from the sac, and reduced it immediately after the intestine. This was easily reduced, but the reduction of the omentum gave some trouble. The omentum did not feel brittle, nor appear to be in a gangrenous state. When the contents of the hernia were reduced, some serous fluid issued out of the abdomen. A purging clyster was ordered to be injected; and he was directed to take half an ounce of castor oil every two hours, till a free evacuation should be produced.

February 3d. I found him in a good state at noon. The clysters had procured a stool, and after the second dose of the castor oil he had had three evacuations. His pulse was at eighty-six.

Notwithstanding these favourable appearances, the symptoms of inflammation, such as vomiting, foreness of the

abdomen, with considerable pain, returned in the evening. Eight ounces of blood were taken from his arm, a clyster was injected, the ol. ricini was repeated, and a large blister was applied to the abdomen. These means afforded no relief, and the poor man died at seven in the morning.

In the evening I examined the contents of the abdomen. The intestines appeared in many places inflamed, and adhered to each other universally. That part which had been strangulated was of a darker colour. The omentum did not cover the anterior surface of the intestines as usual, but passed down on the left side of the abdomen, collected together like a thick rope. The strangulated portion was now become very brittle, and was dark coloured at its inferior part. Bloody serum was contained within the abdomen.

REMARKS.

1. This case affords a decided instance, in addition to others already published, that the neck of the hernial sac is capable of becoming so contracted as to produce a fatal strangulation. The contents of the hernia seemed to suffer no injurious pressure from the abdominal ring; for I found no difficulty in introducing my finger for the purpose of dividing it.

2. Though I think it highly probable, that some degree of inflammatory affection had taken place in the whole of the intestinal canal previously to the operation; yet from the great alteration in the appearance of the reduced omentum, compared with its appearance at the time of the operation, I cannot avoid thinking that the injury which that part had suffered was one considerable cause of the fatal termination. It is possible that when the omentum is in a state tending to gangrene, though not appearing unsound, it may suffer irreparably from a degree of pressure in the reduction, which would not have injured it had it been perfectly sound.

3. Though our conjectures respecting the safety of a patient under a different treatment are often, perhaps, the consequence of regret, rather than of sound judgment; yet I am constrained to think that the operation might have had a more favourable issue, had it been performed at an earlier period of the disease, and had the omentum been left in the situation in which it had probably lain for several years.

The gangrened state of the omentum comes next under consideration. The distinction between the sound and the gangrened part is often so evident, that a surgeon cannot mistake the one for the other; but this is not always the case. I have seen the omentum have a livid appearance when its texture was sound; and I have seen it very little altered in colour, when its texture has shewn it to be in an unsound state. In this latter case the omentum becomes crisp or brittle. I do not recollect any author who has described this state of the omentum except Mr. Warner.*

When the portion of omentum found in the hernial sac is, from its diseased state, unfit for reduction, it may be tied, cut off, or left in the wound to separate spontaneously. I shall offer what I have observed respecting these three different methods of treatment.

The first has, I believe, been done without proving fatal to the patient. Le Dran and others have given instances of it. But if the ligature is made so tight as to destroy the circulation in the part below (which is that kind of *tying* of which I am now speaking) the practice is extremely dangerous, and ought, in my opinion, to be laid aside. Mr. Wilmer apprehends no danger from it; but his opinion, in this instance, is contradicted by experience. He says, "When it is necessary to remove any part of the omentum; there will be no occasion to pass a ligature; but if the surgeon chooses to do it, if he is careful that no part of the intestine is included,

* Warner's Cases in Surgery, ed. 3d. p. 192, 193.

"it is not probable that any particular inconvenience will arise from it."* Monsieur Pipelet has written an excellent Memoir on this subject,† in which he has shewn from experience the danger of this practice. But the most decided condemnation of this practice occurs in the writings of Mr. Pott.‡ He has with great candour related the fatal effect of such a practice in a patient of his own. I saw him perform the operation (to which I apprehend he alludes) in the year 1758. The patient was in perfect health, and had an epiplocele, which was only troublesome by its bulk. The omentum was quite sound. A tight ligature was put upon it, and the part below was cut off. The symptoms which succeeded are thus accurately described. "I have seen a whole train of bad symptoms, such as nausea, vomiting, hiccough, fever, anxiety, restlessness, great pain in the belly, and an incapacity of sitting upright, or even of moving without exquisite pain, precede the death of a man, whose omentum was tied merely because of its enlargement," &c. *ib.* Surely no surgeon, who has read this account, can, with a good conscience, apply a tight ligature upon any considerable portion of omentum in a sound state.

There is, however, another method of employing the ligature, which is not attended with the danger above described. I made use of it in the following case with success.

CASE XI.

Henry Taylor, of Thornton, about thirty miles from Leeds, a stout man, aged thirty-four years, had been subject to a scrotal hernia for some years, which had several times been reduced with difficulty. It became prolapsed and strangulated in the evening of May 5th, 1789. He

* Observations on Herniæ, p. 78.

† Memoires de l'Academie de Chirurgie, tom. iii. 394.

‡ Pott's Works, octavo edit. vol. ii. p. 117.

was bled, had clysters injected, and was put into the warm bath. On the evening of the 7th he set off for Leeds, to put himself under my care. He travelled all night in a cart, and arrived at Leeds on the morning of the 8th. He was much fatigued with his journey. I procured a lodging for him, and put him to bed immediately. His pulse was at one hundred, rather full and hard. He had a great pain in the hernia and abdomen, both which were so sore, that he could scarcely bear them to be touched. He had a frequent vomiting, to allay which he had drunk some gin and water upon the road. I took a pound of blood from his arm, and injected a clyster made with the decoction of tobacco. He became rather easier, but there was no diminution of the tumour. I applied cloths dipped in cold water, and threw up the fume of tobacco per anum, without success.—At noon I performed the operation. No fluid issued from the hernial sac when first opened. A large mass of omentum lay in the sac, including a portion of intestine, in such a manner that it could not be seen till the omentum was expanded. The omentum was very livid, or rather black, on its exterior surface. Some fragments of it within appeared sound. The sound and unsound parts were intermixed, so that there was no line of separation between them. It did not feel brittle. One part of it was compact and smooth like the mesentery. A filament went off from this part, and adhered to the peritoneum just within the ring. The intestine was inflamed, and had contracted an adhesion to the omentum, about two inches in length, and one in breadth. That part of the omentum which adhered to the intestine was quite black, but was easily separated from it by gentle pulling. The stricture from the abdominal ring was not great, for I could with ease introduce my finger for the purpose of conducting the bubonocoele knife. There was no stricture from the neck of the hernial sac. The intestine was reduced with ease.

The great difficulty in this case was, how to dispose of the omentum. Its bulk was such, that when taken out of the hernial sac, it appeared, after the reduction of the

intestine, to be more than double the quantity which one could suppose capable of being compressed within the compass of the sac. It was thought, by some persons who were present at the operation, to be six or eight ounces in weight.—The reduction of so diseased a mass was out of the question. To make a tight ligature upon it would, as I apprehended, be in effect to destroy my patient. I was by no means satisfied to make so large a wound in the omentum as would be necessary to extirpate all that was prolapsed; and the diseased parts were so intermixed with those which appeared to be sound, that it was impossible to make a separation between them. Indeed, there was such a gradation between the parts which were clearly mortified and those which were as clearly in a sound state, that I could not have drawn the line of separation had I attempted it. Pressed with these difficulties on every side, I determined to leave the omentum as it was, covering it with lint spread with digestive, and over all a large pledget of tow spread with the same.

My patient felt himself easy after the operation, and had no more vomiting. I ordered a purging clyster to be injected, and half an ounce of *ol. ricini* to be given every two hours. Some fecal matter was discharged with the clyster. He took five doses of the *ol. ricini*, and then ceased taking it. He had five or six liquid stools before the next morning, but did not discharge any figured excrement. His pulse intermitted in the evening; but as he had very little pain, and no vomiting, I was not uneasy, having several times observed such intermission, in some acute diseases, to be a symptom of *saburra* in the *primæ viæ*, and to go off after a free evacuation.

10th. He had passed a quiet night. Pulse regular, and at ninety-six. The discharge by stool having ceased for some hours, I directed a repetition of the *ol. ricini*. I desired my patient to take no solid food, but to live intirely upon broth, barley water, gruel, and the like.

11th. Pulse from seventy-six to seventy-eight, in the morning. From this time his bowels were kept open by

the continued use of the *ol. ricini*, given as occasion required. His pulse had now and then a little intermission, but this symptom never continued long.

About one third part of the omentum was cast off in a gangrened state; but two-thirds of it, at the least, remained sound, and in the course of a few days this part began to have fresh granulations on its surface.

Notwithstanding the advantage which I seemed to have gained by avoiding the hazard of any operation upon the omentum, yet it was easy to foresee, that great difficulties would arise from so large a mass of granulated flesh (for such it soon became) remaining in the wound. It was impossible to compress it within the lips of the wound; and as the integuments now lay behind it, there was no hope that they would ever ascend to form a natural covering to so prominent a part. In ruminating upon the different methods of treating this incumbrance, I recollected that I had often seen deep fissures made in sound parts of the body, by the gradual pressure of any sharp-edged substance, applied without any such design, and effected without much pain. I therefore determined to attempt cutting through the omentum, close to the abdomen, by the gradual, yet very gentle, pressure of a ligature. On the 7th day after the operation I began to apply a ligature of waxed silk, but in so gentle a manner as to give no pain. The application produced a bluish appearance in the tumour, and made it feel to the patient a little benumbed. The ligature was tied in such a manner, that the patient could at any moment unloose it; and he was directed so to do, if he should feel any pain, sickness, or nausea.

On the first day after this application, he had some shivering, and uneasiness in his belly. His bowels were likewise moved with greater difficulty by the *ol. ricini*. These symptoms were attributed to the ligature, which was immediately untied. But upon inquiring into all circumstances, I found that he had, contrary to my directions, eaten some flesh meat that day, which I imagined

might have caused some uneasiness. After two or three loose stools, these complaints ceased. I urged the necessity of a more strict attention to his diet, and renewed my request that he would confine himself to broth and light pudding during the use of the ligature.

I renewed the application every day, insinuating dossils of lint into the fissure; and on the 17th day of this process I cut through the small remaining part of the omentum, which had now been nearly divided by the ligature. An artery in the centre of the remaining part was become so large as to require the use of a needle and ligature. By this gentle method I safely removed the mass of omentum, after which the wound healed very speedily, and my patient returned home six weeks after the operation, the wound being then nearly cicatrized. The portion of omentum which I cut off weighed five ounces and five drams avoirdupois.

The excision of a portion of omentum in the sound part has been practised, and recommended by some eminent surgeons. Monsieur Caqué, chief surgeon of the Hotel Dieu at Rheims, says, that in nine operations he had cut the omentum in its sound part without ligature, and that no unfavourable accident had resulted from this treatment.* Mr. Pott speaks in the strongest terms in favour of this method. He says, "The fear of hæmorrhage is almost, if not perfectly, without foundation, as I have several times experienced." And again, "I will not pretend to say, that there never was a dangerous or fatal flux of blood from the division of the omentum without ligature; but I can truly say that I never saw one; that I have several times cut off portions of it without tying, and never had trouble from it of any kind, though I have always made the excision in the sound part; and that, from the success which has attended it, I shall always continue to do so, whenever it shall become necessary." Vol. ii. p. 116, 118. I have twice, and only twice, cut

* *Memoires de l'Academie de Chirurgie*, tom. iii. p. 407.

off. a pretty large portion of omentum in its sound part, in the operation for the strangulated hernia; and I am sorry to say, that in both cases the reduction of the remaining omentum was followed by hæmorrhage, which nearly proved fatal to one of my patients. I will relate the cases.

CASE XII.

Sept. 16th, 1795. Moses Bradford, aged sixty-one years, was brought into the General Infirmary at Leeds, with a strangulated scrotal hernia, on the right side. He had been subject to the hernia for several years. The strangulation had commenced in the forenoon of the preceding day. He had vomiting, hiccough, fulness and tension of the abdomen.—His tongue was clean and moist. His pulse at seventy. The tumour was very tense near the ring. The operation was performed at three in the afternoon. The contents of the hernial sac were a portion of omentum in a sound state, and a portion of intestine highly inflamed. The omentum was of a pyriform figure. Its broad part adhered to the bottom of the sac, and was about the size of an ordinary pear. The upper part had contracted no adhesion with the sac, and was about the thickness of one's little finger. There seemed no reason to doubt that the omentum had remained in this state for some years.

I could not introduce the tip of my fore-finger, for the purpose of dividing the ring and neck of the hernial sac, but was obliged to make use of a director. After an opening was made, capable of admitting my finger to pass into the abdomen with ease, I could not still reduce the intestine, until I had divided the omentum, which I did at the lower part of its neck. Mr. Logan held its upper part between his fingers for a short time after the division, to see whether it would bleed; and as no hæmorrhage took place, I reduced it, and afterwards replaced the in-

testine with ease. I removed the remaining part of the omentum which adhered to the sac.

No sooner was the reduction of the intestine completed, than florid blood began to flow from the abdomen. We could not doubt that this hæmorrhage proceeded from the divided omentum, and were sorry that we had not suffered it to lie a little longer out of the abdomen. The divided part had been pushed up so high by the intestine, and, indeed, had retired so readily before the intestine was reduced, that there was not the least probability of laying hold of it.

I ordered sal. amari ʒ j. to be taken every hour in a cupful of cold water, immediately after its solution, and directed the application of cloths, dipped in cold water, to the abdomen.

I visited the man again in the evening. The hæmorrhage, which was never considerable, had diminished before I left him, and had now ceased. He felt himself easy. The purging salt, which did not sit easy upon his stomach, was omitted, and the ol. ricini was directed in its stead. Pulse seventy-four. A purging clyster was injected.

17th, morning. He had taken an ounce and a half of the ol. ricini, which he had retained. He had had three small stools. His belly was rather more tense. Pulse seventy-six. The ol. ricini was continued, and the clyster repeated.

Evening. I found him much worse. He had vomited up all the ol. ricini in the afternoon at one copious evacuation. He had a frequent hiccough and retching. His belly was much inflated. His pulse was become irregular, though not very frequent. I directed a clyster to be injected, made with the decoction of tobacco, and the following draught to be given:

℞. Magnes. alb. ʒij.

Aquæ puræ cochleare j. vel ij.

f. haustus alternis horis sumendus, superbibendo cochl. j. succi limonûm.

18th. These means had afforded my patient great relief. His stomach was settled, and he had had in the night a copious evacuation by stool. His belly was now soft and flaccid. Pulse seventy-two. 19th and 20th, he continued doing well. His bowels sufficiently open. Pulse seventy.

21st. Liquid fæces began to flow through the wound, without any previous bad symptom.

22d. I directed a laxative clyster to be given once a day, and laid aside the use of purgatives taken by the mouth. He has natural crepitus alvinus from the anus.

23d. He had lain dry all night, but this morning liquid fæces, mixed with air, were discharged through the wound. I directed a clyster to be given night and morning, made with a pint of water gruel, and a spoonful of treacle. I also directed his diet to be intirely liquid, as milk in various forms, broth, &c. and forbade him to eat bread, pudding, or rice.

November 16th. Since the last report, the size of the wound, and the quantity of fæces discharged by it, have continued to diminish. He has had all along regular stools per anum, except that twice during this period the regular discharge was somewhat suppressed, at which times he complained of pain in the belly. A dose or two of the ol. ricini, with the clysters, relieved him. Upon making a strict inquiry in the ward, I found that he had at both these times taken some solid food. The wound is now nearly cicatrized, a small aperture only remaining, through which a thin curdled matter sometimes issues. He is otherwise in good health and spirits.

Dec. 11th. He was discharged cured.

A retention of urine accompanied the strangulation in this case, which obliged me to have recourse to the catheter during the two first days. After that time his discharge of urine was natural.

I did not see this poor man after his dismissal from the Infirmary, but was informed, that he was soon after seized

with violent pain in the abdomen, attended with vomiting, and died on the second day of his illness.

CASE XIII.

December 26, 1797. I was desired to visit William Langdale, a journeyman coachmaker, aged thirty-five years, who was said to be violently afflicted with the colic. He complained of great pain in his belly, which was aggravated by fits, and was chiefly felt a little below the navel. He vomited every thing he took, and was costive. Upon inquiry I found a tumour in the scrotum, of which the man had taken no notice, not apprehending it to have any connexion with his disorder. I informed his friends of the true nature of his complaint, and advised them to convey him immediately to the Infirmary. My advice was followed, and at two o'clock I visited him there in consultation with Mr. Logan.

The man informed us, that a swelling similar to that which we now found, though not so large, had at different times affected him. This he had always before been able to reduce, but did not remember to have perceived any gurgling noise during the reduction of the prolapsed part. He seemed quite ignorant of the nature of his disease, but assured us, that he had not a constant swelling in the scrotum or groin. The present seizure took place soon after he rose out of bed, at two o'clock in the morning of the preceding day. From that time he had had frequent vomiting, with great pain in the abdomen, but not much pain in the tumour. The abdomen had now a considerable degree of tension. His tongue was white and furred. His pulse strong, and at eighty-six.

The tumour was of an unusual form. That part of it which lay in the groin had more resemblance to a thickened spermatic chord, than to an ordinary hernia. As the patient repeatedly affirmed, that he had never perceived that gurgling noise, which usually accompanies the reduction of a

prolapsed intestine, when upon former attacks he had repressed the rupture; and as at this attack the pain was chiefly felt a little below the navel, we thought it not improbable that the hernia might be an epiplocele. We determined, however, to try the effect of bleeding and the tobacco clyster before we proceeded to the operation. A pint of blood was immediately drawn, by opening a vein in each arm at the same time; and a clyster made with the decoction of tobacco was injected.

We visited the patient again at four o'clock; and finding no alteration for the better, I performed the operation. The hernial sac contained a good deal of serous fluid, besides a pretty large portion of intestine, enveloped and completely covered by omentum. The neck of the hernial sac, below the abdominal ring, formed so considerable a stricture, that I could not introduce the tip of my finger to guide the curved bistory. It even required some force to introduce a director suitable to this occasion. After dividing the neck of the hernial sac, I could easily introduce my finger within the abdominal ring, which I also divided sufficiently to permit the reduction of the intestine.

The omentum was become gangrenous, and in one part adhered pretty strongly to the intestine. That part of the intestine, which had been inclosed in the stricture made by the neck of the hernial sac, appeared as if it had been tied round by a string. The colour was so much altered by this impression, that we were under considerable apprehension of a separation taking place at this part. I endeavoured to reduce the intestine with all possible gentleness, after I had separated it from the omentum; yet, notwithstanding all the caution I could use, I was much afraid that the operation would not preserve the life of my patient, even if no injury should arise from the morbid state of the omentum.

I had always been afraid of large wounds of the omentum; but as the excision of a gangrened portion, by cutting through the adjacent sound part, stood so strongly recommended by Mr. Pott, of whose judgment I had a very high

opinion, I determined to follow his example in this instance. I cut off, therefore, all that had a morbid appearance, and the remainder, as soon as I ceased to hold it, retired spontaneously into the abdomen.

A hæmorrhage immediately ensued, which, from the distinct colour of different parts of the stream, evidently consisted both of arterial and venous blood. The discharge of blood diminished so much in a short time, that I ventured to unite the divided integuments, through the whole extent of the wound, by the interrupted suture. I ordered a purging clyster to be injected, and half an ounce of ol. ricini to be given every three hours till a free evacuation should be procured.

I visited the patient about two hours after the operation, and found him asleep.

At ten in the evening I was called to him, on account of a violent hæmorrhage which the nurse had just discovered. The blood had flowed through his bed upon the floor. I immediately cut out the ligatures which were in the upper part of the wound, both to give a free issue to the blood, and also to enable me to know the true state of the hæmorrhage.—The blood which now issued out appeared to be venous. It flowed irregularly, sometimes ceasing for ten or twelve minutes. I applied cloths dipped in cold water to the abdomen and scrotum, and kept dabbing the wound with a cold wet sponge. His pulse was weak, and at a hundred and eight. His countenance more pale. The belly less tense. He had had one stool. I left him at half past eleven as the hæmorrhage had then abated, desiring the house apothecary, and my senior pupil, who remained with him, to continue the application of the cold cloths till the hæmorrhage should cease, and to give the ol. ricini every three hours.

27th. The hæmorrhage ceased at half past one in the morning. At three he was left to the care of his nurse. His pulse was then at a hundred and twenty. I saw him at eleven. Pulse a hundred and eight, and weak. Tension

of the abdomen less than before the operation, but yet too great. Had had two good stools. *Ol. ricini* continued. He vomited two or three times in the course of the day, and was restless. Belly more tense in the evening. Tongue furred. Complained much of thirst. Had frequent belchings, and pain in the belly.

28th. I found him much better. He had had very copious evacuations by stool. Vomiting had ceased; the belchings were diminished. Pain in the belly abated, but not removed. Pulse a hundred and two. Countenance much improved. He had taken near five ounces of the *ol. ricini*; ordered it to be discontinued.

He remained in a very uncertain state during the first fortnight after the operation. His belly tender, and often inflated, particularly during the second week. His pulse from ninety-six to a hundred and eight. He had no return of the vomiting. He was always relieved, whenever the unpleasant symptoms became aggravated, by purging him with the *ol. ricini*, though he was never constive.

At the end of the second week his tongue became clean, his urine of a natural colour, his abdomen more soft and easy, and his pulse varied from eighty-six to ninety-six. His wound had all this time looked well, being soon filled with good granulations. He was now permitted to sit up a little every day, but was allowed nothing more solid for food than boiled pudding. His belly continued tender, and sometimes painful, for several weeks, but he recovered perfectly at last, and, after his dismissal, followed his former laborious employment.

REMARKS.

This case clearly shews, that large wounds of the omentum are attended with danger.—As the termination was favourable, I am not sorry that the operation was performed as Mr. Pott and Monsieur Caqué have advised; but I shall never again cut off any large portion of omentum, without applying a ligature to every bleeding vessel,

whether artery or vein, before I permit the remainder of the omentum to retire into the abdomen.*

I do not attribute the dangerous symptoms, which continued for a fortnight, to the excision of omentum, but rather to the diseased state of the intestine. Had the operation been deferred to the succeeding day, or even for a few hours, it is highly probable, that the prolapsed part of the intestine would have separated from that above the stricture. Indeed, our hopes of the poor man's recovery were at a very low ebb, when we perceived the impression which the stricture had made upon the intestine.

It has been proposed to make the incision in the mortified part of the omentum as near as possible to the sound. But I cannot avoid thinking, that those who speak of such an operation as always practicable, speak under the influence of theory, rather than from experience. Sometimes the sound and mortified parts are so intermixed, (as in Case X.) that it is impossible to leave the former and remove the latter. At other times the gradation of appearance, from sound to mortified, is such, that one cannot determine where the line of separation will lie.

The last method of treating a gangrened portion of omentum is by leaving it in the wound, after reducing what appears clearly to be sound, if there be any such prolapsed. This method has answered well in three cases, in which I have tried it, and seems to be peculiarly adapted to those cases, in which the omentum has lain for some time in the hernial sac previously to the strangulation. In two of the cases, the diseased part was cast off on the seventh day after the operation; and in the third case, on the eleventh. All the patients recovered.

* Since these observations were written, Mr. Home has published some cases of strangulated hernia. In one patient, upon dividing the omentum with a pair of scissars, "Two arteries on the cut edge bled so violently as to require being secured by ligatures."

Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. ii. p. 102.

The remaining part of the operation consists in the treatment of the wound, after the reduction of the prolapsed parts. The method which was perhaps universally followed till of late, was that of introducing a dossil of lint, tied with a thread, into the aperture made by dilating the abdominal ring. This was done with the view of giving vent to any matter, whether blood, serum, or pus, which might require to be discharged from the abdomen. This method I have usually followed, and am not aware that it has ever prevented the recovery of a patient. However, I see no objection to the method of uniting the lips of the wound by the interrupted suture. When there is nothing to be discharged, it is undoubtedly the best method of treating the wound. It will not prevent the drawing away of a ligature put upon any bleeding vessel of the omentum; nor entirely prevent a discharge from the abdomen, which may come on soon after the operation. What effect it would have had in Bradford's case, where the *fæces* began to flow from the abdomen on the fifth day, I will not take upon me to say, as I mean to lay my experience, rather than my conjectures, before the reader. Mr. (now Sir James) Earle recommends the including a part of the hernial sac in the ligature which is used to bring on the adhesive process in the wounded parts. I can say nothing against this method from experience, except that I have twice seen the *vas deferens* lying on the anterior part of the sac, which would be in danger of being included in a ligature that took hold of the sac. I may add also, that it is not necessary to include the hernial sac in the ligature in order to produce a speedy union of the wounded parts, as I have witnessed.

The medical treatment of the patient must depend in some measure upon the circumstances of each case. I shall only observe in general, that purging with the milder cathartics, aided by a very slender diet, is the best method that I know for removing the inflammatory symptoms, which may succeed the operation.

Miscellaneous Observations relative to the Strangulated Hernia.

1. I think it is not a bad general rule, that the smaller the hernia, the less hope there is of reducing it by the *taxis*. Long continued efforts to reduce a prolapsed intestine are most likely to succeed in old and large hernias, when no adhesions have taken place.

2. As a strangulation of one side of an intestine is not a common disease, I shall relate an instance of the complaint, as it may afford some instruction to the young practitioner.

CASE XIV.

A labouring man, aged fifty years, subject to a small scrotal hernia, which always retired upon lying down, had the misfortune to strike the scrotum and hypogastrium against a post, as he was walking in the streets in the evening, November 28, 1767. A vomiting immediately supervened, which soon went off, but returned in the morning, and continued all day. I saw him in the evening. There was no appearance of a bruise upon the abdomen or scrotum. The former was somewhat tense, and seemed to be very painful when pressed. There was a very small tumour in the right groin, not exceeding the bulk of a cherry. It was free from tension, though painful when touched. It did not retire upon pressure. The patient informed me, that the rupture was now less than it used to be, when he was in an erect posture; but had not retired as usual upon lying down. He seemed to be in great pain, for the sweat ran down his face, though his situation was far from being warm. His pulse was about one hundred, but neither full, nor tense. His tongue whitish. His urine was discharged in small quantities.

About sixteen ounces of blood were taken from his arm. The cathartic bitter salt was directed to be taken in small doses, combined with an opiate; and a purging clyster was injected.

30th. The pain in the abdomen had continued severe all night. The vomiting also remained. The abdomen was more swelled, especially in the epigastric region.

At eleven in the forenoon he had a pretty large stool, of proper colour and consistence, but was not relieved by it. Mr. Billam, a surgeon in Leeds, visited him along with me soon after this evacuation. The purging clyster was repeated, and after it a mild clyster was injected. A blister was directed to be applied to the abdomen. Extract. cathartic. \mathfrak{z} j. thebaic. gr. iiss. were given, and the solution of purging salt repeated. His pulse was small, and at a hundred and twenty. The vomiting continued. At nine in the evening we visited him again. He had had a loose stool, but was not relieved. He had another evacuation in the night; but died about three o'clock in the morning.

I obtained leave to examine the contents of the abdomen, which I did in the evening, in the presence of Mr. Lucas, surgeon, and others.

I first removed the integuments covering the small tumour. There was a slight protuberance of the peritoneum, appearing just below the abdominal ring, and lying on the inner side of the spermatic chord. This afterwards was found to be a small hernial sac; but I did not open it till I had examined the contents of the abdomen. The intestines had an inflamed appearance throughout; they adhered in many places to the peritoneum, and universally to each other. They were covered by a thick inflammatory exudation, which in some parts appeared to be one-eighth of an inch in thickness. A large quantity of purulent matter was diffused in the abdomen. A small portion of the ileon, not more than half the breadth of the intestine, was contained in the small hernial sac, and adhered so strongly to it, that a hole was made in the in-

testine by drawing it gently out of the sac. The omentum had an inflamed appearance. A portion of the ileon adhered to the bladder, which also appeared inflamed.

This poor man died about fifty-six hours after he had received the blow. Whether the operation for the strangulated hernia, if performed at an early period of the disease, would have afforded any probability of recovery, I shall leave to the judgment of others. It is of use to know that one side of an intestine may be strangulated, and become gangrened in the hernial sac without any external tension. That in such a case, a patient may have discharges of even solid excrement. That when a strangulation subsists, the danger is not diminished in proportion to the smallness of the hernia. That a hernia may retire in part, and the remainder suffer a fatal strangulation. And lastly, that a full and tense state of the pulse is not a constant concomitant of a highly inflamed state of the intestines.

I have related the above case from my notes, but would not propose the treatment as a model to the young practitioner. In inflammatory affections of the intestines opiates ought not, in my present opinion, to be given early in the disease, with the view of abating the pain. The effect of purgatives is restrained by them. But it is from the full effect of purgatives that any permanent relief can be obtained. I have taken no notice of the warm bath, though it was directed, as the want of accommodations prevented it from being used in a way likely to be serviceable.

3. The importance of operating in an early stage of the disease cannot be urged too forcibly. A mortification will sometimes come on before the disease has been of long continuance, or the symptoms have become remarkably urgent. An instructive instance of this is related by Mr. Wilmer*.

The delay also gives rise to *adhesions*, which may frustrate the effect of an operation.

* Observations on Herniæ, p. 73.

CASE XV.

In December 1763, I performed the operation for the femoral hernia on a middle aged woman, the sixth day of the strangulation, which was the first of my visiting her. The intestine and omentum were both prolapsed, and adhered so strongly to the peritoneum, that they could not be reduced, though a large aperture was made through the femoral ring. The intestine burst about twenty-four hours after the operation. She died on the ninth day after the operation.

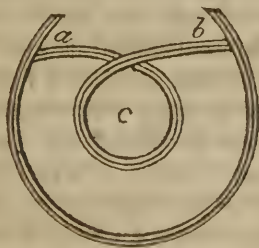
Upon examining the contents of the abdomen after death, I found the whole intestinal canal, except the colon, strongly marked with signs of preceding inflammation. The ileon, part of which had been prolapsed, adhered to the peritoneum in many places, to the bladder, and to the appendicula vermiciformis. Where it adhered to the last, it was completely gangrened about the breadth of a shilling. Upon separating the parts which adhered to each other near Poupart's ligament, a good deal of well conditioned pus issued out, though I had never perceived any to flow from the abdomen during the life of the patient. The omentum was collected together like a rope, and passed down from the stomach and colon along the root of the mesentery, the small intestines lying before it. This situation of the omentum had drawn the lower orifice of the stomach almost into a vertical position. The transverse arch of the colon was so much compressed by the omentum, running across it, that the solid fæces were obstructed in their passage. The omentum was retained firmly in this situation by the adhesions which it had formed with the peritoneum near the femoral ring. The bladder was discoloured where the intestines adhered to it.

4. There are cases upon record of the intestines suffering a fatal stricture, by some natural part fixed impro-

perly,* and by præternatural cords formed in a manner which we cannot explain.† A curious instance of the latter kind occurred in a patient who came under the care of Mr. Lucas, at the General Infirmary.

CASE XVI.

August 1786. An old man was brought into the Infirmary with a pretty large scrotal hernia, in a state of strangulation, in which state it had been about twenty-four hours. The tumour was very painful when touched. After trying the effect of a decoction of tobacco, given by way of clyster, and cold stupes, Mr. Lucas performed the operation. A large portion of intestine was prolapsed, and had approached so near to a state of mortification, that it was of a livid hue, and had a cadaverous smell. The cause of this speedy transition from a sound to a highly diseased state was, a stricture which the intestine suffered from a præternatural membranous cord, like a piece of whip-cord, which adhered, by its extremities, to the opposite sides of the hernial sac, and completely surrounded the intestine. The following sketch will give some idea of the nature of this circumvolution.



The outer curved line represents a transverse section of the hernial sac, when divided at its anterior part. *a. b.*

* Physical Essays of Edin. vol. ii. Art. 28.

† Memoires de l'Academie de Chirurgie, tom. iii.

are the extremities of the membranous cord. *c.* the annular aperture through which the intestine passed, and in which it was strangulated. The intestine was of its natural colour above the stricture formed by this circumvolut ed cord; below, it was in the state above described.

The patient began to have a natural discharge of *æces* about four hours after the operation, and had many stools; but died on the second day.

5. When a double hernia presents itself to an operator, the case becomes very perplexing. Instances of this kind ought, therefore, to be recorded, to put the young practitioner upon his guard. Mr. Wilmer has given a remarkable instance.* I have twice seen the existence of this disease, and will give a short account of both cases, as they differed considerably from each other in some circumstances.

CASE XVII.

September 16th, 1795. While I was operating upon Moses Bradford, whose case I have already related, John Barrett, aged forty years, was brought into the Infirmary with a strangulated scrotal hernia. He had been subject to a hernia for some years, and the strangulation had now subsisted four days. There was much tension in the tumour, though no external inflammation. He vomited frequently, had some hiccough, with a fulness and tension of the abdomen. We strongly recommended an immediate operation, but the man refused his consent. A clyster made with decoction of tobacco was injected; and cloths dipped in cold water were frequently applied to the tumour, after sprinkling upon it some crude sal ammoniac in powder. Pulse eighty-six.

17th, at nine A. M. The poor man, finding himself worse, consented to the operation, which was immediately performed. His abdomen was more enlarged. His pulse a hundred and twenty.

* Practical Observations on Herniæ, p. 105.

Upon opening the hernial sac nothing appeared but omentum, the surface of which was smooth, and the texture apparently sound. It adhered universally to the upper part of the sac, and I could find no aperture of the abdominal ring. This state of the parts was perplexing. I now attempted to draw the omentum out of the hernial sac, that I might have the opportunity of examining more accurately the state of the parts. I was prevented from removing the omentum completely by an adhesion which it had contracted with the bottom of the sac. I was able, however, to elevate the greater part of it, and this elevation enabled me to discover a fold of the intestine ileon lying behind the omentum, and surrounded by it. The posterior surface of the omentum was smooth and shining, forming the anterior part of an interior hernial sac for the intestine; the posterior part being formed by the true hernial sac, which also included the omentum.* Upon tracing this interior sac I was led to the aperture through which the intestine had descended. This aperture was so large that I could easily introduce my fore-finger into it. The coats of the intestine were thickened, but had not much of an inflammatory appearance. The interior sac was complete at its upper part, and was there quite distinct from the sac which I had first opened, and in which lay the omentum. The interior sac contained intestine only. The omentum seemed to have no communication with the abdomen. I divided longitudinally the omentum, and the interior hernial sac, which was either formed by, or adhered intimately to, the omentum. I then enlarged the aperture of the abdominal ring, and reduced the intestine, though with some difficulty, on account of the increased thickness of its coats. I cut off the omentum from every part of the exterior sac.

If the interior sac, in this case, was formed by the omentum, the disease must have subsisted in this state for

* In this case the hernial sac was in reality divided longitudinally into two cavities by means of the omentum. From the anterior cavity there was no opening into the abdomen. The posterior cavity opened into the abdomen as usual.

a considerable time : for the sac appeared to be as regularly formed at its upper part as if no omentum had been prolapsed ; and when I introduced my finger into the abdomen through the ring, I had the same sensation as in a simple enterocele. If the interior sac was not originally formed by the omentum, it is difficult to account for the appearance of the parts at the bottom of the exterior sac.

This patient recovered extremely well for the first ten days, and was then seized with the locked jaw, of which he died at the end of the second day of the seizure.

I examined the contents of the abdomen after death, but observed nothing which could account for this fatal termination. Every thing relative to the hernia seemed to indicate the approach of a perfect cure.

CASE XVIII.

In January 1796, I was desired to visit Mrs. Brooke of Harewood, whom I had some years ago cured of a strangulated femoral hernia by the operation, and who now laboured under the same disease on the opposite side. The strangulation had subsisted three days. She vomited frequently, and had had no stool ; yet the abdomen was soft, her pulse calm, and her tongue clean.

I immediately performed the operation. There was nothing in the hernial sac but omentum, except a large quantity of serous fluid. The omentum was in part gangrened, and adhered to the sac. I could find no aperture into the abdomen. My patient seemed convinced, that the intestine had been down before I began to perform the operation ; and from the accurate description which she gave me of the different states of her disease, I saw no reason to doubt the truth of her conjecture. She assured me, that during the operation, she had the sensation which she was accustomed to feel whenever the intestine retired into the abdomen. The hernial sac was much wrinkled, as if after being distended it had fallen into a

collapsed state. I cut off all that part of the omentum which appeared diseased, as well as all that projected from the hernial sac. That part which appeared sound, and adhered closely to the sac, I suffered to remain, lest I should wound the sac; for its irregular wrinkled surface made the excision difficult.

The patient recovered very well, but the hernia returned, and a truss was applied to prevent the intestine from descending as usual.

In this case it seems to me highly probable, that the interior surface of the omental sac became the exterior surface of the intestinal one. Had not the intestine retired while I was dividing the hernial sac, I should have found a double hernia, one omental, and the other intestinal.

6. When the testis does not descend into the scrotum before birth, care should be taken to prevent the descent of the testis from being followed by that of the intestine or omentum, in which case the disease would be formed, which is now distinguished by the name of *hernia congenita*. It may seem a contradiction in terms to say, that I have known a hernia congenita first formed when the patient was sixteen years of age. But my reader, who understands the nature of this disorder, will know, that the term describes a distinct species of hernia, rather than the time of its formation.*

CASE XIX.

In the year 1765, I was desired by Mr. Billam to visit along with him a young man, aged sixteen years, labouring under a strangulated scrotal hernia. The right testis had, a short time before the attack of this disease, descended into the scrotum. The descent of the testis was succeeded by a hernia, which soon became strangulated. After

* See an accurate description of this disease in Dr. Hunter's Medical Commentaries, part 1st.

bleeding he took fifty drops of laudanum, divided into three doses. The pain, which he felt in the tumour, abated. He fell into a sound sleep, which continued three or four hours; and upon his awaking, it was found that the hernia had retired. A truss was applied to prevent a relapse.

The following year, while the truss was removed for the purpose of repairing it, the hernia returned, and immediately became strangulated. Various means were used to procure a reduction, but without effect. On the fourth day of the strangulation, I performed the operation at the request of Mr. Billam, and in the presence of him and Mr. Wynne. Both omentum and intestine lay in the tunica vaginalis testis, which in this case constituted the hernial sac. They were both of a dark colour, but not in a state of mortification, except a small part of the extremity of the omentum, of which there was some doubt. The omentum adhered slightly both to the intestine and hernial sac, but they were easily separated. After the division of the abdominal ring, the intestine was reduced without hesitation; but some difference of opinion, or considerable doubt at least, arose respecting the reduction of the omentum. The omentum was at length reduced without any retrenchment, after the opinion of the majority of the surgeons present.

Symptoms of inflammatory affection succeeded the operation. The patient was relieved by bleeding and purging, but died at the expiration of a week after the operation. The wound had a good aspect during the whole of this subsequent illness.

I obtained leave to examine the contents of the abdomen after death. That part of the omentum which had been prolapsed was now completely mortified, and lay just above the ring, which was healed internally, so that no aperture remained in the peritoneum. The remainder of the omentum adhered in several places to the intestines. The small intestines in general did not appear much inflamed; but that portion which had been strangulated was

in a gangrenous state. The colon on the right side appeared much inflamed, and in many places of a dark colour. The diseased portions of intestine adhered to the contiguous parts. A small production of omentum was attached to the spermatic chord, or rather to the peritoneum covering it, about an inch above the left testicle. By this attachment the testicle had been prevented from descending into the scrotum.

7. An *Epiplocele* is a troublesome disease, considered simply, and also, as it frequently gives rise to an intestinal hernia. If it is reducible, no doubt can remain as to the propriety of applying a truss. When irreducible by the taxis, it may often, perhaps always, be made to retire, if it has contracted no adhesion with the hernial sac. I have cured several troublesome cases of this kind, by confining my patient to bed, giving at the same time gentle laxatives, and enjoining a low diet. In one case the confinement of a week was sufficient to effect my purpose; in general, however, it has required five or six weeks. The epiplocele, upon its first descent, is sometimes attended with pain in the abdomen, as well as in the tumour, and then greatly resembles a strangulated intestinal hernia. But if the patient can retain light food, and purgative medicines, upon his stomach, there is usually no necessity for performing the operation for the strangulated hernia. In this case, the pain and tumefaction of the abdomen may generally be removed by a free evacuation of the bowels. Though every symptom of danger be removed by this treatment, the stricture upon the omentum is sometimes so great as to cause a gangrene of that part which is contained in the hernial sac. The integuments then become inflamed in a short time, purulent matter is formed, and the tumour must be treated as a common abscess. See Case IX.

A truss should always be worn after the reduction of the omentum.

8. It sometimes happens, after the cure of a strangulated hernia, that the rupture does not return, but the general result is otherwise.

Judging from my own experience, I should say, that a larger quantity of intestine usually descends, in those persons whose lives have been preserved by the operation, but that the intestine in such persons is less liable to strangulation. A well adapted truss should always be applied as soon as the wound is cicatrized, and will bear the pressure

An Account of a New Species of Scrotal Hernia.

CASE XX.

November 6th, 1764. I examined the body of a child, fifteen months old, who had died of a *strangulated scrotal hernia*, in the presence of Dr. Crowther, a physician who then lived at Leeds.

The intestines were not much inflamed, but had in general their natural appearance. The jejunum and ileon were considerably inflated with air; but the colon was so much contracted, that it looked like a solid cord rather than a hollow intestine. The cæcum, or head of the colon, was not to be seen in the abdomen; for it had descended through the abdominal ring, which formed a stricture upon that part of the intestine where the ileon joins it. In the stricture was also included the root of the appendicula vermiformis; the rest of this appendage being still in the abdomen.

Having examined the contents of the abdomen without altering the state of the hernia, I made a longitudinal division of the scrotum on its right side, continuing my incision the whole length of the tumour, and laid bare, as I imagined, the hernial sac. This I opened towards its

inferior part, which was the most prominent; but it proved to be the *tunica vaginalis testis*, containing, together with the testicle, a portion of the true hernial sac.

This unusual appearance engaged me to prosecute the dissection with great care. I found that the *tunica vaginalis* was continued up to the abdominal ring, and enclosed the hernial sac, adhering to that sac by a loose cellular substance, from the ring to within half an inch of its inferior extremity. The fibres of the cremaster muscle were evident upon the outside of the exterior sac, or *tunica vaginalis*. The interior or true hernial sac was a production of the peritoneum as usual, and contained only the cæcum or head of the colon. The strangulated part of the intestine appeared to have been much inflamed, and was in some places become black: it was considerably distended, and was filled with liquid fæces. Having removed the proper hernial sac, I examined the posterior part of the exterior sac, and found it connected with the spermatic vessels in the same manner as the *tunica vaginalis* is, when the testis has descended into the scrotum. An additional proof, that the exterior sac was the *tunica vaginalis*.

From all these circumstances it is evident, that this hernia differed both from the common scrotal rupture, in which the hernial sac lies on the outside of the *tunica vaginalis*; and also from the *hernia congenita*, where the prolapsed part comes into contact with the testicle, having no other hernial sac besides the *tunica vaginalis*.

To understand the cause of the hernial sac being in contact with the testicle, and surrounded by the *tunica vaginalis*, it is necessary to consider the manner in which this coat of the testicle is originally formed.

In the fœtus a process of the peritoneum is brought down, through the ring of the external oblique muscle of the abdomen, by the testicle as it descends into the scrotum; which process forms an oblong bag communicating with the cavity of the abdomen, by an aperture in its upper part. This aperture is intirely closed

at, or soon after, birth. The upper part of the bag then gradually contracts itself, till the communication between that portion of it which includes the superior and greater part of the spermatic chord, and the lower part of the bag, which includes the testicle and a small share of the chord, is obliterated. The lower part of the process or bag retains its membranous appearance, and is called *tunica vaginalis testis propria*; while the upper part becomes an irregular cellular substance, without any sensible cavity, diffused amongst the spermatic vessels, and connecting them together.

In the hernia which I am describing, the intestine was protruded after the aperture in the abdomen was closed; and therefore the peritoneum was carried down along with the intestine, and formed the hernial sac.* It is evident also, that the hernia must have been produced while the original tunica vaginalis remained in the form of a bag as high as the abdominal ring; on which account that tunic would receive the hernial sac with its included intestine, and permit the sac to come into contact with the testicle. The proper hernial sac, remaining constantly in its prolapsed state, contracted an adhesion to the original process of the peritoneum which surrounded it, except at its inferior extremity: there the external surface of the hernial sac was smooth and shining, as the interior surface of the tunica vaginalis is in its natural state.

The mother of this infant informed me, that she first perceived the rupture when the child was about two months old. As male children are often attacked with a scrotal

* Mr. Hunter supposes (Med. Comment. p. 84.) that a *hernia congenita* may be formed after the aperture of the original tunica vaginalis has been closed; the violence with which the intestine is protruded bursting open the closed aperture of that tunic. But it does not seem to have occurred to him, that a hernia of the kind I am describing might be produced, if the peritoneum should not again be burst open. I have purposely examined the parts in several still-born children, and have found, that, when the aperture of the original tunica vaginalis is closed, the peritoneum has appeared to be as firm where the aperture had been, as in any other adjoining part.

hernia in the first or second month after birth, it is probable that the disease may often be of this species, when it comes on at so early a period of life. This kind of scrotal hernia may, therefore, not improperly be called *hernia infantilis*, as it can only exist when the rupture is formed while the parts retain the state peculiar to early infancy.

The scrotal hernia may be divided into three species, the specific difference of which arises from the state of the tunica vaginalis at the time of the descent. 1. If the abdominal aperture of this process is open when the intestine or omentum is protruded, the rupture is then called *hernia congenita*.* 2. If the upper part of the process remains open, but the abdominal aperture is closed, and is capable of resisting the force of the protruding part, the hernia then becomes of that species which I have now described, the *hernia infantilis*. 3. If the cavity of the upper part of the process is obliterated, and the septum is formed a little above the testicle, as in the adult state; the hernial sac then descends on the outside of the tunica vaginalis, and forms the most common species of scrotal rupture, which may with propriety be called *hernia virilis*.

CASE XXI.

In November 1772, I was desired to visit an infant born with an uncommon tumour at its navel. I found the funis umbilicalis distended to the bulk of a hen's egg at its insertion into the abdomen, though it was of its usual thickness in every other part. The distension of this part of the funis had rendered its external coat so transparent,

* The term *hernia congenita* must be here considered as *technical*, describing a particular state of the parts affected, and not implying that the disease exists at the birth of the subject. This disease ought to be distinguished by the name of *hernia congenita scrotalis*; as there is another species of hernia congenita, which the reader will find described in the following cases.

that I could clearly discern through it the folds of the small intestines, which had been protruded through the navel before the child was born. I had never seen this species of hernia before; but soon determined what method to pursue for the cure of it.

I immediately reduced the intestine, and desired an assistant to hold the funis compressed so near to the abdomen, that the intestine might not return into the hernial sac. I procured some plaster spread upon leather, cut into circular pieces, and laid upon one another in a conical form. This compress I placed upon the navel, after I had brought the skin on each side of the aperture into contact, and had laid one of the lips a little over the other. I then put round the child's abdomen a linen belt; and placed upon the navel a thick, circular, quilted part, formed about two inches from one extremity of the belt.

This bandage kept the intestine securely within the abdomen, and was renewed occasionally. The funis was separated about a week after birth; and at the expiration of a fortnight from that time the aperture at the navel was so far contracted, that the crying of the child when the bandage was removed, did not cause the least protrusion. I thought it proper, however, to continue the use of the bandage a while longer. A small substance, like fungous flesh, projected, after the funis had dropped off, about half an inch from the bottom of that depression which the navel forms. A dossil of lint spread with *cerat. e lapide calaminari*, and assisted by the pressure of the bandage, brought on a complete cicatrization.

I saw the child for the last time December 30th. The fungous substance had then disappeared, a firm cicatrix covered the navel, and the child was perfectly well.

CASE XXII.

In the year 1775, I was called to see a new-born child, whose intestines had escaped at the navel out of the cavity

of the abdomen. I found the whole of the small intestines lying upon the belly, not enclosed in any sac. The midwife informed me, that she had found them in this state as soon as the child was born, which was about four hours before I saw it; but she was of opinion, that the quantity of intestine prolapsed had increased somewhat since the birth of the child. The intestines had an inflamed appearance. Upon examining the funis umbilicalis, I found that it had been much distended near the navel, and was now burst. I was satisfied, therefore, that this hernia was similar to that described in the last Case; and thought it probable, that the hernial sac had burst in the delivery. I reduced the intestines immediately, and as carefully as I could; but the child died within a few hours after the reduction.

The child appeared to be in a very weak state when I first saw it. It had universally a blue colour, and its face was deformed.

CASE XXIII.

In March 1791, a child was brought to my house, fifteen hours after its birth, having a large tumour in the navel-string. The funis was distended greatly to the distance of four inches from the body of the child; and its exterior membrane was so transparent, that I had no difficulty in discerning the contents of the tumour. Almost all that part of the intestinal canal, which, by being attached to the mesentery, is capable of receding from the spine, seemed to be contained in the dilated part of the navel-string. I could clearly see not only the small intestines, but also the colon, with the appendicula vermiformis; yet the aperture at the navel was very small.

There was no peristaltic motion in any part of the prolapsed intestines.*

* The want of the peristaltic motion in the intestines I attributed to the compression which they suffered at the entrance of the hernial sac. I have often felt this aperture at the naval more dilated in an exom-

The midwife had very properly tied the navel-string beyond the dilated part, so as not in the least to injure the intestines.

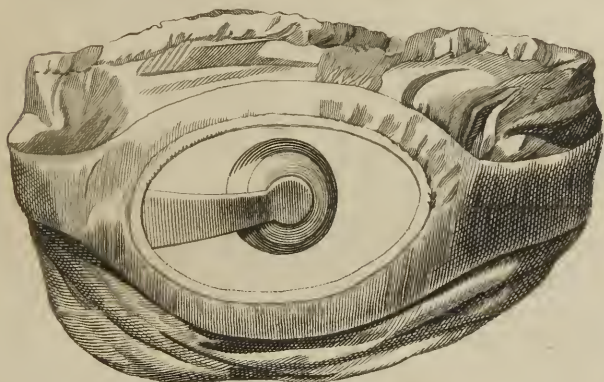
I found it difficult to reduce the prolapsed parts; but by gentle pressure I made them all return into the abdomen in the space of about half an hour. I wrapped some flat tape round the dilated part of the navel-string; and applied a belt, quilted with wool, near one of its extremities, round the belly of the child, that I might keep up an easy compression upon the navel.

The hernia did not return, but the child became uneasy after the reduction: and, although it had two natural stools, yet it died about forty-eight hours after the operation.

Description of a New Truss for the Exomphalos.

WHILE I am upon the subject of Hernia, I think I shall confer a benefit on those who are afflicted with the Exomphalos, by recommending a truss invented for that complaint by an ingenious mechanic in Leeds. I have applied it both to infants and adults with invariable success; and I think it to be greatly superior to any kind of truss hitherto used for that disorder. With the leave of the maker I have presented my reader with a front view of it. It consists of two pieces of thin elastic steel, which surround the sides of the abdomen, and nearly meet behind. At their anterior extremity they form conjointly an oval ring, to one side of which is fastened a spring of steel

phalos which did not exceed the size of a common plum. The peristaltic motion of the intestines remains in the prolapsed state, provided they are not compressed at their exit from the abdomen. I once saw a remarkable instance of this in a woman who had an extremely large femoral hernia. The integuments were rendered so thin by the great distention which they suffered, that the peristaltic motion of the intestines might very distinctly be perceived. The lowest part of this hernia extended to the middle of the patient's thigh.



A TRUSS FOR THE EXOMPHALOS;

Invented by
W^m. Harrison, of Leeds,
TRUSS MAKER.

B. Tanner sc.

Engraved for Humphreys

of the form represented. At the end of this spring is placed the pad or bolster that presses upon the hernia. By the elasticity of this spring the hernia is repressed in every position of the body, and is thereby retained constantly within the abdomen. A piece of callico or jean is fastened to each side of the oval ring, having a continued loop at its edge, through which a piece of tape is put that may be tied behind the body. This contrivance helps to preserve the instrument steady in its proper situation.

The annexed plate will sufficiently explain the structure of the principal parts of this instrument.

CHAPTER IV.

OF THE FUNGUS HÆMATODES.

CASE I.

JUNE 21st, 1780, William Campinet, aged twenty-one years, a stout young man, by trade a stone mason, was brought into the General Infirmary, on account of a very large tumour on the inside of the right thigh and knee. Upon inquiry he gave the following account of his case.

About two years before that time he perceived a small swelling the size of the last joint of his thumb, on the inside of the right knee, not far from the *patella*. This tumour was moveable, and gave no impediment to the motion of the joint: it was not discoloured, but was painful when moved or pressed upon. It continued in this state half a year; and then, the man having hurt his knee by falling against a stone, it gradually increased in bulk, but did not exceed the size of an egg. The skin was now discoloured with blue specks, which he took to be veins. He could still walk with ease and follow his business; but could not bear to kneel upon that knee.

Two months before his admission into the Infirmary, he fell from a piece of wood, placed about a yard from the ground, and violently bent the diseased knee; but did not strike it against any thing. The tumour began immediately to enlarge; and, within a few hours, extended half way up his thigh, on the inner side of the limb. About a fortnight after this last accident, the skin burst at the lowest part of the tumour, and discharged some blood.

A dark-coloured fungous, about the size of a pigeon's egg, appeared and remained at this part. A few weeks after the appearance of this fungous, the skin burst in another part of the large tumour, and discharged some blood. From the fissure arose another fungous, which had increased in the course of the last week to the size of a small melon; and now measured eight inches over, between the opposite parts of its base. Blood frequently issued from the base of this fungous, chiefly when the man hung down his leg.

The whole tumour was now of an enormous size. It measured nineteen inches across, when the measure was carried over the fungus last described. From its highest part in the thigh to the lowest part just below the knee, it measured seventeen inches, without including the fungous. The base of the tumour at the knee, exclusive of that part which ran up the thigh, measured twenty-four inches in circumference. The tumour became narrower as it ascended the thigh; and terminated obtusely about the mid-way between the knee and the groin. It did not surround the thigh; but was situated on the inner side of the limb, and was distinctly defined. There was no swelling in the ham, nor within the capsular ligament; but the leg, knee, and thigh, appeared sound where they were not occupied by the tumour. The skin, covering the tumour, was livid in some places, and had several fissures and small ulcerations upon it; but had not burst asunder, except in the two places above described. The tumour was soft, and gave a sensation of some contained fluid, when gently pressed with the hands alternately in opposite directions.

The patient assured me, that he had walked, without pain in his knee, a week before his admission into the Infirmary: and he seemed persuaded, that he could now walk, if he durst venture to put himself into an erect posture. He had come twenty-two miles in a post-chaise; and had lost very little blood by his leg being laid upon the cushion. He complained of the greatest uneasiness in the highest part of the tumour. It had become hot and painful in the night time, for some days past. His pulse beat a

hundred and fourteen strokes in a minute; and was rather tense, but not full. His tongue was clean. He had no thirst. His appetite had been good till within the last few days. He did not remember to have felt at any time a pulsation in the tumour.

June 22d. I called a consultation of my colleagues at the Infirmary: the result of which was, that the tumour should be laid open by cutting off a portion of the distended integuments; and that, after removing the contents, if the sac should be found in a sound state, the disease should be treated as a simple wound; but that, if the containing parts should be in a morbid state, the limb should be immediately amputated.

As the patient had borne so long a journey the preceding day without apparent injury, we did not expect any inconvenience from removing him out of his ward into the operation-room, which was situated at a small distance, and upon the same floor. However, the man lost so much blood from the removal, that he fainted while we were applying the tourniquet. As soon as he had recovered from his *deliquium*, I made an oval incision through the whole of the tumour longitudinally, and removed a large portion of the morbid integuments.

The tumour contained a very large quantity of a substance not much unlike coagulated blood; but more nearly resembling the medullary part of the brain, in its consistence and oily nature. It was of a variegated reddish colour, in some parts approaching to white; and, as blood issued from every part of it when bruised, I judged it to be uniformly organized. This mass was partly diffused through the circumjacent parts in innumerable pouches, to which it adhered; and was partly contained in a large sac of an aponeurotic texture. There was a great and universal effusion of blood from the internal surface of the sac, and from the pouches containing this morbid mass.

The diseased state of the containing parts, and the connexion of the sac with the capsular ligament of the knee, put an end to our idea of saving the limb. Had the appearance

been more favorable than it was, yet the violent effusion of blood forbid all hope of success but by amputation. I immediately, therefore, performed the operation; and found all the muscles in a sound state, except those on the inner part of the thigh, which had been in contact with the morbid substance forming the tumour. These for a considerable depth, were of a brown colour, and softer consistence. The principal artery was in a sound state. I was obliged to take up several small vessels; some of which were near the surface, on the inner side of the thigh; and passed through a part so much diseased, that we could not ascertain whether it was muscle or adipose membrane. As the cavity of the sac became very narrow and shallow, at its highest part, I made the circular incision through the integuments, about two inches below its highest part; conceiving that this small portion of the cavity would soon become a clean sore, and cause no impediment to the cure.

As soon as the patient was placed in bed, I examined the amputated limb, that I might more clearly see the seat of the tumour, and ascertain the state of the parts about the knee.

That portion of the *vastus internus femoris*, which remained in the amputated part of the thigh, was become brown, and much softer than the other muscles; which were in a very sound and robust state. There were many small portions of extravasated blood, lodging in the substance of this muscle. The sac was formed by the aponeurotic covering of the muscle; and had its inferior termination where the aponeurosis begins to make the outer layer of the capsular ligament of the knee. The two fungous substances, which I have already described, appeared to have been only extensions of the morbid mass, where this had made its way through the sac and the integuments. The joint of the knee and muscles of the leg were perfectly sound.

The poor man was very low after the operation, and complained of great pain in the abdomen. This pain was accompanied with a strong pulsation in the *aorta*,

which might readily be felt by laying one's hand upon the abdomen. I gave him immediately *tinct. opii g^{tt}s xxx.* and directed him to drink for nourishment barley water and thin broth. He was often sick in the course of the afternoon; and vomited up the barley water. The pulse at his wrist was so weak after the operation, that it could scarcely be felt. The pain of the abdomen abated in a few hours.

At four P. M. I ordered the following draught to be given every two or three hours; with wine whey for common drink:

℞ Aq. puræ ʒj.
 Sp^t piment. ʒij.
 Conf. aromatic. ʒj. m.

I visited him again in the evening; and, finding the vomiting still to continue, though his sickness was somewhat abated, I ordered *tinct. cardam. comp.* ʒij. diluted with three times its quantity of water, instead of the former draughts.

June 23d. I was called to see him betwixt four and five in the morning. He had an uneasiness in his throat, accompanied with a sense of suffocation, which awaked him frequently when he fell asleep. He was likewise troubled with the hiccough; and threw up every thing that he took. His pulse was too frequent to be counted. His countenance, however, was somewhat improved. The stump was quite easy. I directed him to take occasionally two drops of essential oil of cinnamon, upon a lump of sugar; and ordered, for his common beverage, the best French brandy, diluted with three times its quantity of water, in which as much cinnamon had been previously boiled as would make it grateful.

A cataplasm was laid upon the region of the stomach, consisting of *theriac. androm.* ʒj. *aq. ammon.* ʒij.

Nine, A. M. He had not vomited since he began to drink the brandy diluted with the decoction of cinnamon. His pulse was at a hundred and forty-two. The hiccough still affected him a little after talking.

Four, P. M. Pulse a hundred and thirty-six. No vomiting. Tongue rather dry. Ordered veal broth for food. He had had no stool since his admission into the Infirmary, yet was in a state of such extreme debility from inanition, that I thought it best to delay the use of laxatives in any form. I did not give him an opiate to-day, as he had no pain in the stump; but as the spasmodic affections of his throat and stomach had been so considerably relieved by the grateful stimulants, which he had taken, I directed them to be continued.

24th. Pulse a hundred and thirty-two, and somewhat fuller. Tongue dry. He had not got much sleep in the night, yet he seemed better. Diet continued.

25th. Pulse the same. The nurse shewed me a broad livid spot upon his back, just above the *nates*, which was evidently an incipient mortification. I ordered that cloths wet with *aq. ammon. acet.* should be kept constantly applied to the part affected. The decoction of bark, made warm with the spirituous tincture, was directed to be given in the dose of three spoonfuls every two hours.

26th. Pulse a hundred and sixteen. The progress of the mortification stopped.

27th. Pulse a hundred and twelve. He began to have an appetite for food; and was allowed to take pudding and broth. The wound had a glossy appearance. A good deal of *pus* was discharged from the interstices of the muscles.

28th. Pulse a hundred and ten. His tongue was more moist and clean. A little flesh meat was allowed for his dinner.

His countenance was improved. The uppermost part of the longitudinal wound (which had been the extremity of the sac) was healed to the extent of an inch: the rest of it remained sloughy, and was dressed with a digestive ointment.

From this time the granulations of flesh upon the stump became good; the progress of healing was favour-

able, and the cicatrization was nearly completed, at the expiration of the sixth week after the operation; when a new source of trouble engaged my attention.

That small and superficial part of the great sac, which I had left at its superior extremity, from an unwillingness to amputate more of the thigh than appeared necessary to be removed, was now healed: but there had gradually risen at the lower and inner part of the thigh, beneath the cicatrix, a tumour which was now about four inches in length, and between two and three inches in breadth. This contained a soft substance, exactly similar, as far as the touch could discover, to that which had filled the large sac. This tumour was painful; and now discharged, sometimes a bloody serum, and sometimes dark coloured blood, through four or five small orifices or fissures in the cicatrix.

Not yet fully aware of the obstinate nature of this disease. I hoped to produce good granulations from the internal surface of this tumour, and to cure my patient, by exposing that surface to the air. I thought it right, at any rate, to make trial of this method, being extremely unwilling to proceed, without absolute necessity, to a second amputation.

August 3d. I made a longitudinal incision through the whole extent of the tumour; and removed the substance which it contained. This substance was exactly similar to that which occupied the large tumour, and which I have already described. Some fresh blood was found in this as well as in the large tumour. When I had intirely removed the contents of the tumour, the cells, in which the morbid substance had lodged, bled freely; although no distinct blood-vessel was visible. The blood resembled that of the veins in colour, and flowed more copiously when the upper part of the thigh was compressed, than when it lay still without pressure. The wound was filled with lint, and covered with a pledget of cerate.

No advantage, however, was obtained by laying open the tumour. The interior surface was found to be in too morbid a state to produce sound granulations. Blood

continued to ooze out of the wound for a few days. The interior surface then became covered with a blackish substance, which gradually extended itself, and formed a new fungous. A variety of escharotics were applied, with the view of destroying the fungous and the morbid surface of the wound. But in vain. The growth of the fungous always exceeded the quantity destroyed. Undiluted oil of vitriol, applied liberally, had very little effect.

I was now reduced to the necessity, either of removing the whole morbid part by excision; or of performing a second amputation. The diseased part was perceptibly circumscribed, as well as superficial; and therefore, upon a consultation with my colleagues, it was determined to attempt the removal of the diseased part without amputation.

26th. No sooner was the thigh raised from the bed, for the purpose of applying a tourniquet, than a copious hæmorrhage took place. The tourniquet was applied with all possible expedition; and I began to remove the fungous substance: but every attempt to do this increased the hæmorrhage, so that we were compelled to apply a second tourniquet. The greatest compression, which we could make, was not sufficient to put an entire stop to the bleeding.

Upon examining the wound carefully, when the contained substance was removed, we found the muscular flesh degenerated into a hard mass, which felt somewhat like cartilage. The adipose membrane was also diseased, and was formed into large cells or pouches, in which the fungous substance had been lodged. This examination convinced us, that the patient could not be saved from immediate death, but by a second amputation; which was immediately performed above the diseased part of the thigh.

Every part of the thigh above the incision appeared to be in a sound state, except the principal artery. This was filled with matter, somewhat resembling stiff coagulated blood, which prevented the blood from flowing through

the extremity of the divided vessel. The inside of the artery, when touched with the point of the scalpel, felt hard; and gave a sound resembling that which arises from gently scraping a bone. The principal vein was pervious, and in its natural state. We had not occasion to take up more than two small arteries. The stump was dressed after Mr. Alanson's method, by bringing the divided parts as nearly into contact as could be, and without the application of lint.

My patient was so much exhausted by the hæmorrhages which had happened previously to the operation, and during the first stage of it, that, for a short time, he was deprived of the use of his right arm, and could scarcely speak articulately. He was very faint, but had no delirium, as at the former amputation. He complained of great pain at his navel. I gave him *tinct. opii* gr^{ss} 40, in a cordial draught; but he swallowed it with some difficulty.

In the evening his pulse was tremulous, and could not be distinctly counted. He had regained, in a great measure, the use of his right arm; but he still faltered in speaking. The pain at his navel was much abated. He vomited frequently; but had no hiccough, nor difficulty in breathing. I directed him to take the decoction of bark, with the addition of a little of the tincture of bark; and to drink now and then of the decoction of cinnamon with French brandy.

27th. 8 A. M. I found him very low. The diluted brandy, which had been so grateful and beneficial to him before, was now become unpleasant; so that the smell of it excited retchings. I ordered him to drink a little ale whenever he chose, as that was the liquor for which he had now the greatest desire. His pulse could not be counted; the faltering in speaking continued, and his countenance was very languid.

Five P. M. Pulse a hundred and forty-five. The vomiting had ceased, and all the other symptoms of extreme debility were abated.

The ligatures were cast off before the expiration of a fortnight after the operation. The wound looked glossy, but continued to contract in its dimension as fast as could be expected. He had had at times, since the last amputation, a little difficulty in breathing, attended with pain in the thorax; but now he began to complain of a troublesome cough, which disturbed him chiefly in the night-time. The weather was very hot, and he perspired profusely at nights. A diarrhæa came on, but was soon checked by giving him a decoction of logwood along with that of the bark. The *elix. vitriol. acid.* abated his profuse perspiration. His cough became less troublesome, and he breathed better. He was allowed to sit up in his chair as much as he could bear without fatigue. He was usually cheerful. He was allowed a little flesh meat at dinner three or four times a week; and three half-pints of ale in the course of the day. His breakfast and supper consisted of milk porridge, or hasty pudding made with oatmeal and water. As soon as he was able to be removed, he was sent home into the country. I was afterwards informed, that his cough never left him, and that he died consumptive about half a year after he had left the Infirmary.

REMARKS.

In this Case, the large mass, constituting the tumour, appears to have been originally formed by an extravasated fluid, which in a short time became organized. It is not to be supposed, that a tumour coming on immediately after a violent sprain, and, in the course of a few hours, extending itself from the knee half way up the thigh, could be formed in any other way than by the rupture of some vessels, pouring out their fluid contents into the cellular substance of the thigh. But of what nature was this fluid? We know that pure blood will remain extravasated for a long time unchanged. The substance found in this patient's thigh had not the appearance of pure coagulated blood. It was indeed chiefly, but not uniformly, of a

red colour; and when handled it felt rather like the medulla of the brain, than coagulated blood, being of a consistence somewhat unctuous. Was it blood mixed with a large proportion of lymph? The texture of the substance might lead to this supposition, which receives strength from the consideration, that the tumour was situated in that part of the thigh where the largest lymphatic vessels are found.

An ingenious friend of mine has suggested, that the aponeurotic expansion covering the small tumour on the knee, was lacerated by the fall, which set the fungous confined beneath it at liberty; and that from the violence done to this substance, proceeded the effusion, which occasioned the soft tumour in the thigh, so suddenly formed after the accident.

Whatever the fluid was originally, it appeared with sufficient clearness to have become organized; for the contents of the tumour bled freely wherever they were broken by the hand.

The growth of this fungous was not prevented by the strong aponeurosis which covers the muscles of the thigh; for that covering was first distended, and then ruptured in two places by the fungous.

Where the fungous was exposed to the air, its colour was much darker, and it appeared there more like coagulated blood than in its interior part, the colour of which was somewhat variegated.

All the parts which lay contiguous to the fungous had a morbid appearance. The muscular fibres were become brown, and indistinct. The adipose membrane formed a variety of distinct pouches, filled with the fungous, the surfaces of which bled freely when the fungous was removed. The aponeurosis had lost its natural gloss, and had acquired a brownish hue.

It deserves to be noticed, that at the second amputation, the hæmorrhage from the morbid fungous could not be restrained by the application of two tourniquets to the

thigh; yet, after the amputation of the stump, there was no difficulty in restraining the hæmorrhage from the vessels of the thigh, by the usual pressure of one tourniquet. As the fungous was situated at the extremity of the stump, it was highly improbable, I might say impossible, that the hæmorrhage should have continued from the veins, in the degree in which it did continue, without some supply from the arterial system.

It appears from this instance, which is not a solitary one, that the pressure of the tourniquet upon the thigh in amputation, (and the pressure in this case was much greater than usual), does not completely obstruct the passage of blood in the arteries: it only diminishes so much the force of the current, as to enable the vessels, when in a sound state, to exert their natural contractile power, so effectually as to prevent hæmorrhage.

The contractile power of a sound artery is great. It is very common to see an artery bleed copiously when imperfectly divided, yet to cease bleeding immediately, or in a very short time after a complete division. It would seem, that this natural contractility of the capillary vessels constituting the fungous was greatly diminished, as a hæmorrhage from them could not be restrained by any degree of pressure which we could make upon the superior part of the limb.*

* I do not recollect to have met with an observation of this curious circumstance in any author whom I have consulted. Yet I have seen the same occurrence more than once.

A woman was admitted into the General Infirmary on account of a tumour near the ankle, which had arisen from a blow given by the foot of a person who was insane. When the tumour was opened, the contents had the appearance of coagulated blood. Upon attempting the removal of any part of the contained substance, a considerable hæmorrhage ensued, which could not be suppressed by the application of two tourniquets. In consideration of the morbid state of the parts, it was judged necessary to amputate the leg. After amputation, the divided vessels shewed no greater tendency to hæmorrhage than in ordinary cases of amputation.

This Case occurred before I was acquainted with the nature of the disease to which I have given the name of *Fungous Hæmatodes*. I am

As this is a disease which has not hitherto been described by any author with whose writings I am acquainted, I have taken the liberty of calling it *Fungous Hæmatodes*, a name as expressive of its character as any I could devise.

In my remarks on this Case, I have ventured out of the path of *practical observation*, and have wandered into that of *theory*. The facts are stated faithfully; but I am not anxious about the theoretical reasoning, which forced itself upon my mind, in a review of this curious Case. If any of my readers can give a more satisfactory explanation of the phenomena, I am content.

Pulmonary consumption is sometimes the consequence of violent hæmorrhage, when the patient is greatly reduced by the evacuation, especially if the hæmorrhage has been repeatedly renewed. I have seen this happen so often in patients who had no apparent tendency to consumption, that I cannot doubt of the fact, though I can see no relation between the cause and effect.

CASE II.

July 20th, 1785, I visited Mrs. Dean, of Linton, a maiden lady, aged fifty-four years; who had a considerable enlargement of the left *mamma*. She informed me, that, about three months before, as she was exerting herself in raising her father, (who was superannuated, and confined to his bed), she felt a sensation as if something had cracked in her breast. Within a few days after this accident, she perceived a small tumour in the part, about the size of a hazel-nut. This tumour increased gradually in bulk; was hard, and moveable. When it had arrived at the size of an apple, it was shewn to Mr. Moorhouse, a surgeon at Skipton; who considered it as an occult cancer,

now, upon recollecting the circumstances of the case, inclined to think, that the tumour in this woman's leg was of the same kind as that which I have just described.

and advised extirpation. Afterwards Mr. Priestley, a surgeon at Leeds, (who accompanied me in this visit), being in the neighbourhood of Linton, was consulted. He, entertaining hopes of removing the disease by internal remedies, did not recommend an operation, but advised Mrs. Dean to take the *Cicuta*.

The tumour had increased very much within the last six weeks before my first seeing it; and, when I first saw it, extended nearly to the axilla on one side, and almost to the sternum on the other. Its surface was uneven. The integuments were in general thick; but not universally so. In some parts they felt rather thin; and, upon pressing those parts, it seemed as if the tumour contained a fluid. When I pressed the thick and harder parts of the tumour, I had the sensation of something crackling beneath my fingers; as if, by the pressure, I had broken some fibrous substance. Shooting pains had been felt at times in the tumour from its commencement; they were now more frequent; and Mrs. D. passed the nights uneasily. She was languid, and her appetite was bad.

I was apprehensive that the tumour had arisen from the rupture of some blood vessels, and that it would prove an untractable disease. I thought it too late to attempt extirpation: and, imagining that the integuments would soon give way, and that a considerable hæmorrhage might supervene upon the bursting of the tumour, I informed my patient, that I could not be of any service to her at the distance of thirty miles; and that it would be necessary for her to come to Leeds, if she wished for my assistance.

About a week after this visit, Mrs. D. came to Leeds, and put herself under the care of Mr. Priestley and myself. Within ten days after her arrival she was seized with the dysentery, which was then epidemic in the town. The assistance of Dr. Davison, a physician in Leeds, was requested, in the treatment of the dysentery. During the continuance of this disease, the skin, covering the tumour, gave way; a dark-coloured substance arose in the fissure;

and blood began to ooze out from the aperture, at the base of this substance.

The more I reflected on the origin, progress, and appearance of the tumour, the more inclined I was to believe, that the disease was exactly similar to that which had affected the thigh of poor Campinet. I related this man's case to Dr. Davison, and Mr. Priestley; and expressed my opinion, that Mrs. Dean's tumour would be found to be of the same nature. As the situation of this tumour precluded the advantage of applying a tourniquet, I expected that the hæmorrhage would prove fatal, whenever a large opening should be made. However, I did not choose to withhold my assistance, how little soever that assistance might avail; and consulted the gentlemen who attended with me, upon the method to be pursued, whenever the degree of hæmorrhage should render it necessary to make some farther attempt to preserve the life of our patient.

August 19th, Mrs. Dean was nearly, but not entirely, free from her dysenteric complaints, when the aperture in the tumour became so large as to discharge a considerable quantity of blood. The orifice was now filled with a loose plug of blood. When this was pushed inwards, a great deal of extravasated blood, of a dark colour, rushed out; partly fluid, and partly coagulated.

I cut off a large oval portion of the diseased integuments; with the design, both of preventing the hæmorrhage which they would have caused, and of enabling me to apply the more readily, to the remaining part of the cavity, such styptics as we had determined to make use of.

The fungous substance, which principally constituted this tumour, had the same appearance as that which I have described in Campinet's case; and evidently bled upon being broken. It adhered strongly to the remaining part of the integuments, which formed a great number of irregular cells. Indeed, the whole internal surface of the sac containing this fungous was composed of these cells; except the bottom, formed by the pectoral muscle, where the surface was more even. When the whole of the con-

tained fungous was removed from the bottom of the sac, a portion of the pectoral muscle, about two inches square, was left uncovered. The muscle was in a morbid state; and appeared as if it had been exposed to the air, and had begun to form granulations on its surface. The muscular fibres were scarcely distinguishable. The whole internal surface of the sac bled uniformly, as if the blood had been squeezed from a sponge. To the muscular part I applied Ruspini's styptic; and to the remainder of the cavity hot oil of turpentine. The cavity was gently filled with lint, dipped in these liquids; and the applications were retained in their place by a circular bandage, put round the thorax.

Notwithstanding our patient was kept in bed, in a horizontal position, during the operation, which I endeavoured to perform with all possible expedition; yet she fell into a deliquium before the dressings could be applied. She was, however, soon recruited, and spoke to us cheerfully. We did not remove her in the least from her position; but made her as clean and comfortable as we could. We directed that she should be supplied frequently with wine gruel, and other cordial nutriment of the most grateful kind.

At two o'clock in the night her pulse ceased to be distinguishable; and at eleven in the morning of the next day she expired.

I did not observe any unusual appearance of blood upon the bandages; but Mrs. F. at whose house she lodged, afterwards informed me, that (upon laying out the body) a good deal of blood was discovered to have issued from the cavity of the tumour.

CASE III.

In 1787, Mrs. Appleyard, a middle-aged woman, consulted me on account of a tumour in her breast, which she apprehended to be of a cancerous nature. It occupied the whole *mamma*, was about the size of a small melon,

and was quite moveable. It had not the appearance which cancerous tumours usually have when they affect the whole breast. There was no puckering of the skin, nor shrinking of the nipple; but the integuments of the breast had an uniform smooth appearance. It had not, when examined by the touch, the uneven hardness of an occult cancer; neither had it the equal softness of a tumour containing a fluid in a single cyst. Its surface was even; but, upon pressure, I could feel that the contents of the tumour were not of equal density.

I assured my patient that her disorder was not cancerous; but advised the extirpation of the tumour, as it was highly improbable, that any internal remedies could check the growth of it. However, that I might not seem inattentive to her complaints, and at her earnest request, I ordered some medicines for her. A little time verified my prognostic; and in the course of two months after she first consulted me, the tumour was so much increased in bulk, that she consented to the operation which I had proposed.

The operation was, however, delayed for a week, on account of a sickness and frequent retching, which came on immediately after she had resolved to submit to this unpleasant, though often necessary, method of cure. The uneasiness of mind which she felt from the apprehension of an operation, seemed to be the sole cause of these recent complaints. They were relieved by the use of aromatic and volatile medicines.

Dec. 13th. With the assistance of Mr. Logan I extirpated the tumour, which weighed four pounds three ounces avoirdupois. It was perfectly distinct from the surrounding adipose membrane; having no other connection with it than by that cellular membrane, which universally connects the contiguous parts of the body. When divided by the knife, it had the appearance of a diseased glandular substance, intermixed with small cavities containing a gelatinous, or viscid serous, fluid. As the common integuments, which surrounded this morbid mass, appeared to be in a sound state, I placed them in contact

with the subjacent parts, applying plasters and bandage so as to bring about a healing by the first intention.

My patient went on extremely well for a time, and every circumstance flattered me with the hope of a speedy and happy termination. At the end of the third week, when I was about to take my leave of her, a serous discharge began to take place from the lowest part of the wound, which was nearly, though not completely, cicatrized. After this had continued some days, I perceived a small elevation of the cicatrix a little above the part whence the serous fluid issued. The tumefaction increased gradually, till the cicatrix was burst open. A substance like dark coloured coagulated blood appeared in the fissure. I was at first inclined to think, that some part of the integuments might have remained at a small distance from the subjacent parts, with which I had endeavoured to unite them; and that the small vessels, pouring out blood, might have caused the tumefaction which I have mentioned. I introduced my finger at the fissure; and, finding a cavity extending an inch or two, underneath the cicatrix, I divided the integuments at the cicatrix, and removed the coagulated blood, as it appeared to be. There was, however, a new formation of this substance; on which account I sprinkled the internal surface of the recent wound with finely powdered red præcipitate; that I might produce good granulations, and firm healing. My attempts were in vain. Instead of an union of the parts, I observed a daily growth of the substance, resembling coagulated blood, and an extended tumefaction under the adjoining integuments, which had been firmly united. There was now likewise a daily, though not a considerable, hæmorrhage from the cavity of the wound.

These circumstances produced in me a painful conviction of the nature of this new disease; and I could not doubt that it was similar to the complaint which I have described in the two last cases. My patient at the same time became much indisposed, and was affected with frequent sickness and retching, as she had been before the

excision of her breast. I informed her friends of the dangerous situation in which she now was, and requested a consultation. Mr. Lucas and Mr. Logan, surgeons to the General Infirmary at Leeds, were called in: who concurred with me in thinking that it was necessary to remove the diseased parts, as the only means which could save the life of our patient; though the success of the operation was very doubtful.

Feb. 7, 1788. With the assistance of these gentlemen I performed the operation; making a large circular wound, and removing every part which had a morbid appearance. The fungous had sunk into several cells, which were formed in the adipose membrane; and bled wherever I took hold of it.

For a few days she seemed to be as well as we could expect. But a cough and difficulty of breathing came on before the symptomatic fever had ceased: and she died on the seventh day after this second operation; without any bad appearance in the wound, except such as extreme languor induces.

CASE IV.

Jan. 21st, 1789, Mrs. Storr of York, consulted me at Leeds, on account of a tumour in the left *mamma*. She was forty-five years of age, and had ceased to menstruate for a year and a half. She informed me, that about three months before, she had perceived a tumour nearly of the size of a small apple. It had increased considerably in bulk; especially since the application of a plaster, which appeared to be the *emplast. litharg. cum gummi*. She felt a constant dull pain in the diseased part; but in no great degree. The skin appeared rather red where the tumour was most prominent. The tumour was moveable, and felt hard in some parts; in others it gave the sensation of a contained fluid. It was situated on the exterior side of the *mamma*. I recommended extirpation as the only

probable method of cure; and the next day, at her request, I performed the operation.

The tumour adhered in part to the *mamma*, and had the appearance, when divided, of a diseased glandular substance, interspersed with three or four cysts, containing a viscid serous fluid. The upper part of the wound, which was made in the adipose membrane only, I united by two stitches of the interrupted suture. The lower part, in which a portion of the *mamma* had been divided, was united only by the help of sticking plaster. The upper part of the wound healed by the first intention; but the lower part was not completely healed till the expiration of eight weeks.

One circumstance, which attended the healing of this wound, may deserve to be mentioned; as it afforded some indication of that morbid state of the parts, which soon after produced a fatal disease. During the healing of the lower part of the wound, my patient complained of much soreness and pain in the cicatrices of the upper part, particularly those made by the punctures of the needles. These were so very tender, that for a time she could scarcely bear them to be touched. One of them burst open, and formed a small sore, which did not heal until I had filled it with levigated red præcipitate. This tenderness did not come on immediately after the healing of the upper part of the wound, but after the interval of two or three weeks. It was not attended with any morbid appearance in the lower part of the wound.

About six weeks after the complete cicatrization of the wound, Mrs. S. began to feel a constant uneasiness in the part, and perceived it to be tumefied. The tumefaction and uneasiness increasing, she came again to Leeds, to put herself under my care.

The tumefaction then extended about an inch and a half on each side of the cicatrix. When it was examined by pressure, there was a sensation of a deep seated fluid, covered by thick integuments. The skin, in its most prominent parts, had a blue appearance,

I suspected that the disease, which I have described in the three preceding cases, had taken place: and I desired a consultation. Mr. Lucas visited the patient with me; and, as we could propose no probable means of cure but a second operation, with his assistance I extirpated the tumid parts, which contained a substance similar to that described in the preceding cases. No part of the integuments was left that had the least morbid appearance; and the disease seemed to be completely removed.

The wound was soon filled with good granulations, and the cure proceeded in the most favourable manner for about three weeks. A small portion of the wound at its upper part then began to look sloughy, and formed a cavity extending about an inch under the adjoining integuments. I filled this part with *Hydrar. nitrat. ruber*: but a substance like dark-coloured coagulum of blood arose in it, the growth of which was not repressed by the escharotic. I thought it best to remove this morbid part; and, having divided the integuments about an inch and a half, I dissected out all that appeared to be diseased.

The appearance of the fore continued favourable for some time after the removal of this morbid part; and the progress of healing was as speedy as is usual in sores of such extent. But, before the cicatrization was completed, the parts which had been healed, and the contiguous integuments, began to grow tumid, and to shew too clearly, that the morbid fungous, which had made a second operation necessary, was forming again.

My hopes of a cure were now entirely destroyed. As every part, which had the least appearance of disease, had been twice removed, I saw no probability that any farther surgical assistance could save the life of my patient. She returned home in the beginning of August, and died at the end of five weeks after she left Leeds.

CASE V.

A boy about fourteen years old, was admitted an inpatient of the General Infirmary, on account of a large

deep-seated tumour in the calf of his leg. The cause of this disorder he judged to have been a sprain, from a sudden and violent exertion; for, soon after this accident, he perceived the calf of the diseased leg to be larger than the other. The tumour had continued to increase during six months, and he was now rendered very lame by it.

It was impossible to ascertain, with precision, either the situation or nature of this tumour. It was clearly situated behind the gastrocnemius muscle, and might have its origin near the bones of the leg; so that an attempt to extirpate it by incision, was out of the question. There was no pulsation in the tumour, nor any discolouration in the integuments. The accident which had preceded the appearance of this tumour rather indicated, that it had arisen from the rupture of some vessels in the leg.

Upon a consultation, no probable method of cure was suggested but that of amputation; and, the parents of the boy giving their consent, I performed the operation above the knee.

After the operation I dissected the leg, and found the tumour to consist of a substance similar to that which I have described in the preceding cases, situated between the gastrocnemius and solæus muscles, and extending a little below their edge on the outer side of the leg. Wherever this substance lay in contact with the muscular fibres, they were of a brown colour, and had lost their usual distinct appearance. We could perceive no ruptured vessel; but the lymphatics were not injected.

The patient had a good recovery.

CASE VI.

In April 1793, I visited Mr. Thomas Ward of Saxton, near Tadcaster, aged thirty-three years, who had a large tumour near the ankle of one leg, the circumference of which, including the leg, measured twenty-one inches. The account which he gave me of the origin and progress of this tumour, was as follows:

Four years ago, last winter, soon after he had walked out in the morning, he felt some pain in his heel; and from that time he could not, without pain, put the heel to the ground in walking. Some months after this attack, he perceived, just below the ankle, a small tumour, about the size of a horse-bean, which was moveable, but not painful. This tumour continued to increase in bulk gradually, and was for some time unattended with pain. After sowing some corn in the spring following the first appearance of this tumour, in which exercise he imagined he had hurt himself, the tumour began to increase more rapidly, and was then attended with pain, and an increasing weakness of the leg.

In May 1792, the tumour and weakness had so far increased, that he was but just able to walk about, with the assistance of a walking-stick. At this time he put himself under the care of a person, who applied blistering plaster to the tumour, and rubbed it somewhat severely with tow, when the cuticle was removed. Under this treatment, the size of the tumour, and the weakness of the ankle, were so much increased, that he was in a few days unable to walk without crutches.

About a week before I saw this patient, the tumour had been punctured with a lancet by an old woman, under whose care he had placed himself. A dark coloured fungous, resembling coagulated blood, had arisen from the wound, and was in breadth nearly equal to that of a half crown.

The sensation which the tumour afforded, when examined by gentle pressure, compared with its contents, which were become evident by the wound made in it, left no doubt in my mind respecting the nature of the disease, and the remedy which alone could prove curative.

The mind of my patient revolted at first at the idea of amputation; but in the course of a few days, he became fully sensible of the necessity of this operation, which I performed the following week, but not before he was much reduced by the loss of blood from the fungous.

I was obliged to take up fifteen arteries, after amputating the leg, a little below the calf. The fungous, when divided, appeared variegated like a nutmeg, some parts appearing red, like blood, while others were almost white. It felt greasy when handled. The patient recovered, and continues healthy.

CASE VII.

In November 1796, Mr. Wright, of Horsforth, consulted me on account of a large tumour, situated in the neck of his son, who was about nine years of age; and gave me the following account of the disease:

In April preceding, the little boy happened to fall against the post of a gate. The stroke affected chiefly the lower jaw on one side, and loosened four of the grinders, but made no wound. The bruise appeared to be inconsiderable, and was not expected to produce any unpleasant consequences. Towards the end of the month, the part which had been struck, began to swell gently; and the swelling had a gradual, though slow, increase. In August, the swelling had grown to the size of a small hen's egg. In this state, a poultice was applied to the part affected, which seemed to increase the growth of the tumour, and to render the skin somewhat red.

When I was consulted in November, the tumour was about nine inches in length, and six or seven in breadth. It extended from the lower jaw to the clavicle. From the appearance, and the sensation felt on examining the tumour by gentle pressure, I judged this to be a case of the *Fungous Hæmatodes*. I informed the boy's parents of the incurable nature of the disease, and prognosticated the speedy approach of the fatal event, which took place about ten days after I had seen this patient. The boy's father afterwards informed me, that the tumour seemed to produce suffocation by its pressure upon the windpipe.

CASE VIII.

Richard Finny, the driver of a stage waggon, consulted me in January 1797, on account of a tumour in the back part of his neck, which had been formed in that part about two years, in consequence of a hurt which he had received. I punctured the tumour with a lancet, that I might discover what was the nature of its contents, and found nothing in it but coagulated blood. I brought the lips of the puncture into contact by plaster, that I might produce an adhesion, and immediate healing of the wound; intending to lay open the tumour at a more convenient opportunity. I desired the man to rest from labour till the puncture should be healed. He neglected this advice, and set off soon after with his waggon. He was much exposed to the cold air, the weather being then severe; and an inflammation of the tumour soon supervened. The fever which attended this inflammation confined him upon the road for a time; but he was brought back to Leeds about a fortnight after I had punctured the part. The inflammation still continued; but with proper care subsided, and the contents of the tumour were in part discharged. That I might produce a complete evacuation of the contents without making any large wound in the neck, which now seemed unnecessary, I introduced a seton string, and made it pass through the tumour near its base. By this treatment the tumour seemed to be completely emptied, and gradually disappeared. I then withdrew the string, and the punctures healed.

In the course of a few weeks, a small tumour arose in the same part, which was evidently owing to the dilatation of the original sac by some fluid. Upon puncturing the sac, a fluid of a glairy kind, without colour, issued out. Having reaped so much benefit from the use of the seton before, I made another through the cyst in the same manner, hoping to bring about an adhesion of the sides of the cyst. My expectation, however, proved abortive. Instead of a gradual contraction of the cyst as after the for-

mer operation, the tumour in a short time began to increase, and a discharge of blood took place from some fissures in the distended integuments.

May 27th. I opened the tumour in its whole extent, and removed a fungous, which was now formed in it, excepting a part which adhered so strongly to the muscles of the neck, that I could not clearly distinguish it from the muscular fibres. The hæmorrhage was profuse, and on this account also I was compelled to desist before I had removed the whole of the fungous. The man was so soon recruited after this operation, that on the 6th of June, he was able to come to my surgery to be dressed. After repeated sprinkling with Hydrar. nitrat. rub. the wound put on a favourable aspect. Healthy granulations arose from the surface, and the ulcer became much contracted in its size. I entertained now great hopes of a complete cure: but after some weeks, the morbid fungous began to form itself at the edges of the sore. The integuments were divided where the fungous had elevated them from the subjacent muscles, and the morbid part was sprinkled with escharotics of various kinds. The fungous was reproduced faster than I could destroy it, and the poor man became languid under the increase of this obstinate disease. In November he was admitted a patient of the General Infirmary, and there I once more dissected out the fungous, now become considerably larger. The hæmorrhage was great; but he recovered, and the surface of the wound once more, for some time, put on a favourable appearance. My hopes were again disappointed, and the fungous became larger than ever. Almost every kind of escharotic was tried, but in vain. I could not repress the growth of the fungous by the undiluted vitriolic acid, by the Hydrargyrus muriatus, Antimonium muriatum, nor any other application that was used. In the spring 1798, the man left the Infirmary; a cough supervened, and he died the 10th of June following, exhausted by a hectic fever, and a copious discharge of fetid matter from the fungous, which was then considerably increased in size.

CASE IX.

August 20th, 1801, James Richardson, a stout man, aged fifty years, consulted me on account of a large tumour on the posterior part of his left shoulder. Upon a careful examination I could not doubt of its being a tumour of that intractable species, to which I have given the name of *Fungous Hæmatodes*.

As the knowledge of this disease in its incipient state may be of importance, I will give a description of this case; which I apprehend will not be found inapplicable to the general appearance of the disease, when it arises spontaneously, without any previous operation, upon a part not endued with great sensibility.

The tumour was not painful. It had arisen to a considerable size before the patient was aware of its existence; and it was first pointed out to him by his friends, who observed, that the posterior part of one shoulder was become larger than the other.

It did not interrupt the motion of the muscles upon which it was situated; the patient being able, as he informed me, to follow his laborious employment of a blacksmith as well as usual.

Its situation seemed to be between the integuments and external muscles, a little below the joint of the shoulder, covering a great part of the scapula.

Its form and size may be understood by the following measurement, which I took with a marked tape; from the base on one side, to that on the opposite side, where the breadth was the greatest, carrying the measure over the summit of the tumour, it measured 12 inches. The measure taken across the tumour, in the same way, at its smallest breadth, was 8 inches. Its base measured 23 inches.

When examined by gentle pressure in various ways, it seemed to be of an uneven density. In some parts an

alternate pressure gave the sensation of a deep seated fluid. When grasped by the fingers in other parts, one might perceive an irregular hardness. This examination gave no pain.

It was moveable, but in a slight degree: not so much as a wen formed by an enlargement of the adipose membrane.

The cutaneous veins, which ran over its surface, were enlarged.

Some idea of its growth may be obtained from the following particulars. It was first examined in July 1800, and it was then judged to be about half the size at which I found it. The patient had been lately at Harrowgate, and had used a hot bath there, which he apprehended had much increased the size of the tumour.

The integuments did not seem to be rendered thinner by the distention of the fungous, which I conceived to be lodged beneath and within them.

The skin had been irritated by some stimulating applications which had been made to it. I directed the application of the Cerat. Lap. Calam. to remove this superficial inflammation; and advised the poor man to do nothing else, as I conceived the disease to be incurable.

I shewed this Case to Mr. Logan, my colleague at the General Infirmary, who concurred with me in opinion, respecting the nature of the complaint, and the impropriety of extirpation.

I saw this patient again in February 1802, and was informed by him, that he had been under the care of some irregular practitioners, supposed to be skilful in the cure of cancers. The tumour was much enlarged, and beginning to ulcerate. His countenance was fallen, and his strength seemed to be declining.

CASE X.

Ann Wood, aged 30 years, was admitted an in-patient of the General Infirmary, in February 1802, under the care of Mr. Logan, on account of a large tumour at the extremity of the fore-arm near the wrist; and gave the following account of her case:

About ten months before her admission, she began to feel pain in the wrist of her arm, attended with great weakness, but no sensible tumefaction of the part. About two months after this attack, she perceived a small tumour, near the end of the radius, about the size of a marble, which gradually increased in bulk. About five months before her admission, a seton had been put through the tumour by a surgeon whom she then consulted. After this, the tumour grew more rapidly, and by degrees an excoriation took place in some parts of the tumour, which were more prominent than the rest. Three months before her admission, a hæmorrhage took place from one of these excoriated parts, at which time she lost about eight ounces of blood. The tumour had bled repeatedly since that time, but never to so great a quantity at once.

Mr. Logan called a consultation of the surgeons of the Infirmary, at which it was determined to amputate the arm below the elbow, as the parts above the tumour appeared to be in a sound state. The tumour was not measured, but it was about the size of a moderate melon.

When divided after amputation, the contents were of an ash-colour, though somewhat variegated. To the touch they felt greasy, like the brain. A part of the radius, at its inferior extremity, about two inches in length, was wanting. The ulna was whole, and remained covered with its periosteum, though the tumour lay in contact with it.

The integuments were kept in contact by means of the interrupted suture, and the wound was completely healed on the 13th day after amputation.

When I consider that this disease had subsisted two months, causing pain and weakness in the arm, before any tumefaction was perceived by the patient; that the tumefaction was of small extent at its first appearance; that the periosteum and bone had been destroyed by the disease in that part where it had commenced; and that neither the bone nor the periosteum of the ulna appeared to be injured by it, though the fungous lay evidently in contact with the latter; I am inclined to think, that the disease, in this case, originated in the bone, or at least within the periosteum. It deserves to be considered, whether in a similar case, it would not be the best practice to open the tumour at its first appearance. This seems to be the only method of preventing the dreadful ravages, which we see this disease is capable of making, when left to itself. But I am far from being sanguine, that even this method, together with the removal of what might appear morbid within the tumour when opened, would effectually prevent the growth of this obstinate fungous.

I have now seen sixteen or seventeen cases of this disease, and perhaps many more, when I was not sufficiently aware of its nature, and have not been able to effect a cure in any instance, but by amputation of the limb, when the seat of the disease was in the extremities. A few years ago, I amputated the arm of a middle aged man below the elbow, who had a tumour exactly similar to that last described, but the state of the bone was not examined, nor did I examine it in the case of Mr. Ward (Case VI.) having seen no affection of the bone from it at that time.

If I do not mistake, this disease not unfrequently affects the globe of the eye, causing an enlargement of it, with the destruction of its internal organization. If the eye is not extirpated, the sclerotis bursts at the last; a bloody sanious matter is discharged, and the patient sinks under the complaint.

When the disease occupies merely the adipose or cellular membrane lying upon the surface of the muscles, the tumour is not usually painful in its beginning, nor does it

impede the motion of the muscles on which it is seated. But when deep seated in the limbs, it causes pain and weakness of the part affected. Mrs. Dean found considerable pain from the growth of the tumour in the mamma.

The fungous, as it increases in bulk, does not render the integuments uniformly thin, as in the case of an abscess. In one part the tumour, when pressed with the hands, will afford the sensation of a deep seated fluid, while another part feels hard and uneven. In Mrs. Dean's case, there was a sensation as if some fibres were broken, when the tumour was handled with pressure.

In an advanced stage of the disease, the integuments, and aponeurosis of the muscles, (if the fungous is situated beneath this part) are burst open, and the fungous which rises through the aperture sometimes appears black, like a mass of coagulated blood. At other times the appearance more resembles an excoriation. Under both these circumstances hæmorrhages ensue.

In this process, the integuments do not become uniformly thin, and of a red colour, as when purulent matter is making its way; but they continue to feel thick as usual round the fungous that has burst through them.

This fungous is an organized mass, and bleeds wherever it is broken.

When the parts containing the fungous are divided, they are found to be in a morbid state. The adipose membrane forms a great number of pouches, filled with the fungous, upon the removal of which the pouches bleed copiously, from every part of their internal surface.

Wherever the fungous comes into contact with the muscles, they lose their natural redness, and become brown. They also lose their fibrous appearance, and cannot in every part be distinguished from the adipose membrane, though a distinction is in general evident.

The growth of this fungous cannot always be repressed by the strongest escharotics. Neither the hydrargyrus nitratus ruber, the hydrar. muriatus, the antimon. muria-



B. Tanner sc.

tum, nor the undiluted vitriolic acid, have been sufficient for this purpose.

The annexed plate was engraved from a reduced copy of a drawing, which Mr. Logan had procured to be taken from one of his patients in the Leeds Infirmary, afflicted with the *Fungous Hematodes* upon his arm. The circumference of the tumour including the arm, measured thirty-three inches. The situation of the tumour rendered amputation impracticable, and the disease of consequence proved fatal.

CHAPTER V.

ON DISLOCATIONS.

THOUGH the reduction of dislocated bones is not ranked amongst the most difficult operations of surgery; yet cases sometimes occur in which an experienced Surgeon may find reduction to be an arduous task, or may even be foiled in the attempt. A few observations on this branch of surgical practice, may not, therefore, be unacceptable to the young practitioner.

The *dislocation of the os humeri* at the shoulder, is the most frequent species of dislocation, which calls for the aid of the Surgeon.

Before the reduction is attempted, that part of the arm to which the extending power is to be applied, should be well defended with some soft substance, otherwise the patient feels much unnecessary pain in the operation. Soft

leather, quilted with wool, forms a convenient defence; but I generally make use of a long flannel roller, as being the most readily obtained, with which I cover the lower part of the arm, and upper part of the fore-arm.

Mr. Lucas, when he was my colleague at the General Infirmary at Leeds, shewed me a method of applying a towel for the purpose of extension, which is the most convenient that I have seen; but the description upon paper is somewhat difficult.

Take a piece of linen or callico, about three yards in length, and half a yard in breadth; fold this longitudinally till it is reduced to about three inches in breadth; then place its middle part in an elliptical form, as in Plate VIII. fig. 2, and put the elliptical part round the limb, till the parts *b i* come nearly into contact with each other. Then put the tail *f* through the noose at *i*, and the tail *g* through the opposite end of the noose at *b*, by which means the elliptical part must be drawn tight round the limb, and the tails of this bandage must be used as the means of extension.

If the head of the *os humeri* remains in the axilla, and not far removed from the glenoid cavity, the reduction may sometimes be executed with a very small degree of extension, as in the following cases.

CASE I.

In the summer 1772, a corpulent woman fell from a chair on which she was standing for the purpose of hanging up some linen to dry, and dislocated her shoulder. After I had put every thing in proper order for the reduction, I desired the assistants, who were to make the extension, to keep the arm elevated at a right-angle with the body, till I should direct them to begin the extension. In doing this, they kept the arm a little upon the stretch, waiting for my orders. While the arm was in this state, I placed my fingers below the head of the bone, that I

might be ready to co-operate with them; and pressing my fingers upwards into the axilla, that I might feel the head of the bone distinctly, the reduction was unexpectedly made by this gentle effort.

The result of this case determined me to try, whether reduction might not sometimes be effected with less extension than is commonly used, and consequently with less pain to the patient than is generally experienced.

It appeared to me, upon reflection, that the muscles, when so far stretched as to be rendered painful, begin to re-act, and to resist the efforts made for their farther elongation, I thought it probable, therefore, that a greater degree of extension might be produced before the re-action took place, if the extension were made very slowly; and that the re-action might grow less, or even cease, after it had begun to take place, if the arm were kept in a moderate, but not painful, degree of extension for some time, before any attempt was made to push up the head of the bone into its articular cavity. By acting upon this principle, I have several times reduced a luxated os humeri, with the assistance of very little extension. I cannot say that this method has always succeeded, but it certainly deserves to be tried; and I am inclined to think, that much extension is seldom necessary when the head of the bone remains in the axilla. In all cases, the more slowly the extension is made, the more will the resistance of the muscles be eluded; the probability of success will be increased, and the patient will not suffer any degree of unnecessary pain.

CASE II.

In January, 1773, an elderly man dislocated the os humeri at the shoulder, by falling from a plank which served as a bridge to a ditch. After I had fastened the towels upon the arm, and given directions to the assistants, I examined the situation of the head of the bone in the axilla, before I gave them orders to begin the extension. They put the arm, however, a little upon the stretch in

holding it by the towels; and the gentle pressure which I made in feeling for the head of the bone produced the reduction.

I once saw a luxated shoulder reduced by the mere efforts of the patient.

CASE III.

May, 1774, I was called to an elderly man who had dislocated his shoulder by falling as he was walking. He was very uneasy while I was making the necessary preparations, after I had ascertained the existence of the disease. He walked about the room, putting his arm into various positions, to procure a little ease. With this view he placed his hand upon the back of a low chair, and moving his body in different directions, he suddenly cried out, as if hurt more than usual. He then sat down, and said, that he was easy, and could move his arm better. As soon as my apparatus was ready, and I had taken hold of his arm for the purpose of fixing the towels, I was surprised to find that the os humeri was reduced. There was now a natural roundness in the shoulder below the acromion, though before a hollow was felt upon pressing the deltoid muscle. His elbow, which before stood at a distance from his body, could now be pressed to his side with ease.

When the head of the bone has deserted the axilla, and has slipped under the pectoral muscle, I have observed, that it is brought back into the axilla the more readily, if the extension is made in a direction opposite to that in which it has passed from the axilla. This effect is often greatly promoted by making the extension with the arm elevated, as Mr. White has advised. But when the head of the bone has advanced far under the pectoral muscle, strong extension, by closing the passage through which the protuberant part of the bone should return, often prevents, instead of promoting, reduction. A more successful method of managing these cases will be mentioned in the sequel.

The following instances of difficult reduction may afford some instruction and encouragement to the young practitioner.

CASE IV.

In October, 1773, a stout man was brought into the Infirmary, with a luxation of the shoulder-joint. The head of the os brachii lay deep under the coracoid process of the scapula. I first tried the method which I had most commonly used in this case, which was as follows: the body being supported, and a counter extension made, by means of a broad towel put round the thorax of the patient, the extension of the arm was made by three or four men, first in a direction at right angles to the body, and when the extension was in its greatest degree, by pulling the arm towards the ground at an acute angle to the body, while I attempted to raise the head of the bone by my hands, placed as near it as I could. This method failed; so did that with the heel in the axilla. I then drew up the man a little from the ground by means of verticle pullies, and by this extension the head of the bone was brought into the axilla, so that it could be readily felt through the integuments, but could not be pushed into the articular cavity. I repeated the method first tried, but in vain. I succeeded at last by the following method, which is nearly that recommended by Dr. Kirkland:*

I placed my patient on a cushion upon the ground, and put a towel under his arm near the shoulder, which went over my shoulders. His arm was put betwixt my thighs; and the assistants, who sat on the floor behind me, made the extension with towels affixed to the arm and fore-arm.

When the extension was made to the degree which I judged necessary, I raised up the head of the os brachii by means of the towel which was suspended upon my shoulders, and at the same time depressed the other end of the

* Observations upon Mr. Pott's general Remarks on Fractures, &c., p. 60.

bone, by placing my hands upon it. By this method the reduction was effected.

CASE V.

September 22d, 1774, I was called upon early in the morning to visit Thomas Walker, of Woodlesford, a strong muscular man, and a stone-mason by trade, who had been thrown from his horse the preceding evening, and had been dragged for a hundred yards or upwards by his foot hanging in the stirrup. His left arm was dislocated at the shoulder, and the head of the bone was lodged deep in the axilla, beneath the coracoid process of the scapula.

I first tried to reduce the bone by Dr. Kirkland's method, but in vain. I then directed the extension to be made in a vertical position of the arm, as Mr. White advises,* until the patient was raised from the ground, and immediately tried to reduce the bone with the heel in the armpit, but to no purpose. I made several other attempts, making the extension sometimes with the fore-arm at right angles to the os humeri, sometimes with the whole arm extended, varying also the direction of the extension. All my attempts were ineffectual. I desired my patient to come to Leeds, that I might have the advantage of a pulley, and the assistance of my colleagues at the Infirmary. About eight ounces of blood had been taken from the arm before I was called. I directed a repetition of the bleeding, and the use of the warm bath, as soon as he should arrive at Leeds. I called a consultation at three in the afternoon, and was favoured with the assistance of Messrs. Billam, Jones, and Lucas, at the Infirmary.

The blood had been drawn as I directed, but he had not been put into the warm bath.

Our first trial was made by raising the patient from the ground by a cord, passing over two vertical pulleys, and

* Cases in Surgery, 95 ; or Med. Observations and Inquiries, vol. 2. p. 373.

fastened to the arm above the elbow by suitable straps. I tried to push the head of the bone into its socket while he remained in this state of suspension, but I could not effect it. Mr. Billam tried with his heel in the armpit, having a clue of cotton previously placed in the axilla; upon this clue was put the middle part of a long towel, the extremities of which I took hold of, lying upon the ground, with my foot placed upon the acromion scapulæ. When Mr. Billam made his extension, I assisted by a counter extension, pushing downwards the acromion, and elevating the head of the os humeri. This attempt also proved fruitless. We then repeated the suspension, intending to use Dr. Kirkland's method as soon as he should be let down. As we were removing the straps from his arm, Mr. Jones suggested the idea of letting his arm fall down, without any farther extension. This was done in a gentle manner, but so that the arm fell by its own weight. In this motion, the head of the bone slipped into its socket, but I did not perceive any jerk or sound as is usual in the reduction of dislocated bones. As a good deal of force had been used in this case, it was thought prudent to take four ounces more of blood from him. He slept well that night, and the next day was pretty easy.

CASE VI.

September 22d, 1775, a middle-aged man from Aldborough near Boroughbridge, was admitted a patient of the General Infirmary, on account of a dislocation of the os humeri, at the shoulder, which had happened a month before his admission. The head of the bone lay behind the thick part of the pectoral muscle, and below the coracoid process of the scapula. Some attempts had been made to reduce the bone immediately after the accident, but without success.

After he had lain in the warm bath about twenty minutes, the following methods were used to effect the reduction:

After the arm was properly defended, straps, to which cords were affixed, were fastened by buckles, upon the lower part, and he was drawn up gently from the ground by the help of pullies. Repeated trials by this method produced no sensible effect. We then used Freke's improved Ambi, and at one trial the bone suddenly advanced as if a reduction had taken place; but repeated efforts in this method had not the desired effect. We next made use of the methods recommended by Dr. Kirkland and Mr. White, placing a towel round the operator's neck, and holding back the inferior part of the scapula by means of a roller covered with cloths. Mr. Lucas and Mr. Jones afterwards tried to reduce the bone by the heel in the axilla, and Mr. Lucas perceived a noise during one effort, as if the bone had returned to its place. While the last method was in use, it occurred to me, that extension made in a direction parallel to that of the body was not likely to succeed, while the head of the bone lay so deeply sunk, and behind the pectoral muscle. I therefore advised, that one person should extend the arm at right angles to the body, by the hold of the fore-arm, placing his foot against the side of the patient's thorax: In this way, the person making the extension would not only have a firm support, but would also be enabled to repress the lower part of the scapula by his heel placed against it: That during this extension, another person, lying by the side of the patient, should place his heel against the upper part of the os humeri, as near to its head as possible, and should push it in a direction parallel to that of the patient's body. By this method, the bone altered its situation with such a noise as is usually heard in reductions, and we concluded, that the head of the bone had re-entered the socket; but when the arm was brought close to the patient's side, we found that the head of the bone was still in the axilla. This appearance of success encouraged us, however, to repeat the operation, but the event was the same. We now imagined, that some portion of the capsular ligament might be folded so as to be intercepted between the head of the bone and the glenoid cavity, into

which we judged the bone to have been twice brought. On this supposition, after making the reduction the third time, the os humeri was moved in various directions, sometimes upon its own axis, sometimes upwards and downwards, before we attempted to bring the arm towards the patient's side. Also, while the extension was continued, a flattened ball of tow was thrust up into the axilla by the heel, to prevent the head of the bone from retiring again into the axilla; the arm was then brought into contact with the patient's side, the extension being continued, though in a different direction, and the heel being gradually withdrawn as the arm approached the side. By these means the reduction was completed and confirmed. As the tendency to dislocation was so great, the arm was kept for a few days in contact with the side by a piece of girth web put round the arm and the body of the patient, who was dismissed cured.

REMARK.

I have used with advantage the method just mentioned of preventing dislocation, when the tendency to it has been very great.

Mr. Birkes of Rothwell, had the misfortune to dislocate the os humeri at the shoulder, three times in the course of a few years. The last of these accidents was produced merely by a horse lifting up his head while he was putting on the bridle. His arm being hereby elevated suddenly, the head of the os humeri was thrown out of its socket. I therefore advised him to wear a bandage round his arm and body, which should not suffer the arm to recede so far from his side as to admit of a luxation. He wore this for several years, and thereby prevented a repetition of the accident.

CASE VII.

October 22d, 1793, Mr. D. aged sixty years, and a strong muscular man, was brought to my house in the evening from

A. about fifteen miles from Leeds, on account of a luxation of the right os humeri, which had happened the preceding evening by a fall from his horse. Attempts had been made in vain by an eminent surgeon to reduce the bone. The head of the os humeri was sunk under the thick part of the pectoral muscle. After trying to effect the reduction while my patient sat in a chair; and finding, that in this way I could not bring the head of the bone so far into the axilla as to feel it distinctly, I placed him upon the carpet on the floor, with his right side towards a table, on which stood two assistants. By means of towels fastened round, or rather above, the condyles of the os humeri, they raised his breech from the floor. The extension made by this effort in a vertical direction, drew the head of the bone into the axilla. It seemed to advance as far as the acromion, and gave a snap against the acetabulum, so that I concluded the head of the bone had slipped into the socket. Upon letting the arm fall, I found, however, that the bone was not reduced. I then attempted the reduction with the heel in the armpit, and afterwards in Dr. Kirkland's method, but without success.

I now took eight ounces of blood from Mr. D. and sent him to his inn in a chair; directing the application of a bread and milk poultice to the shoulder. A solution of the bitter cathartic salt was also given.

After Mr. D. had left my house it occurred to me, that as the vertical extension had brought the head of the bone into contact with the acetabulum, I should probably have succeeded in the reduction, if the assistants had moved forwards while the arm was in a state of extension, and had thereby inclined it a little towards the horizontal position.

23d. In the morning I took Mr. D. to the Infirmary, where Mr. Lucas and Mr. Logan met me at my request. Before any attempts were made to reduce the bone, six ounces of blood were drawn from the arm, while Mr. D. stood upright, with the view of producing some sickness by the operation; but the evacuation did not sensibly affect him.

Mr. Lucas having said upon a former occasion, that he had not failed in his attempts to reduce a luxated shoulder since he had applied the towels in the manner already described; an attempt was made while Mr. D. sat in a chair, Mr. Lucas holding back the inferior part of the scapula. This trial failed of success. The arm was afterwards extended in a vertical direction by means of pulleys.

I then put in practice the method which had the preceding evening given the greatest hopes of success, with the additional movements that had occurred to me after Mr. D. had left my house. Two towels were fastened round the arm, as before, just above and upon the condyles of the os humeri; the fore-arm being placed at right angles to the arm, and supported in that position by an assistant. Each towel was held by a person standing on the counter of the shop, while Mr. D. sat upon a carpet spread on the floor. I directed the assistants to elevate Mr. D. gently from the floor, and, while he remained elevated, to move slowly forwards in the direction in which his face was placed. By this method the arm was first extended vertically, and then with an angle, gradually approaching towards a horizontal position. I stood behind my patient, placing two fingers of each hand in the axilla, ready to push upwards the head of the bone, when I should feel it advanced sufficiently in the axilla. Before the arm was brought down to an angle of 45 degrees with the horizon I made the requisite pressure upwards, and the head of the bone passed into its socket.

Mr. D. staid at Leeds till the next day, and seemed to have suffered less from the various attempts to reduce his arm, than one might have expected. He soon regained the use of his arm.

Farther experience alone can determine whether this method of reduction is superior to those which I have mentioned before. It has this advantage, that it requires a very small number of assistants. One stout man, or two at the most, will suffice for elevating a lusty person from the floor in the manner directed.

Whether, in the former difficult cases which I have related, the frequent extension of the muscles had brought them into a state of debility and non-resistance, and had thereby made our last efforts successful; or whether our last efforts were accidentally better adapted to elude the difficulties which opposed the reduction, I shall leave to the judgment of the reader. Perhaps both these causes might contribute to our success.

It will be observed, that in several of the cases above recited, the counter extension was applied so as to press back the inferior angle of the scapula, and depress the acromion. This is contrary to the directions given by Mr. Bromfield in his *Chirurgical Observations*, who used to cause the acromion to be pushed backwards, so that the glenoid cavity might be separated as far as possible from the head of the os brachii during the extension. These different methods of practice merit an attentive comparison, that it may be decided on which side the superiority lies.

It is not completely settled amongst Surgeons whether the fore-arm, during the extension, ought to be in a right line with the arm, or at right angles to it. Mr. Pott* and Mr. Thompson† strongly recommend the latter; while Mr. White‡ is clearly of opinion that the former is preferable. Experience has not determined my mind on this point. My common method is to bend the fore-arm to a right angle with the arm; but in some of the most difficult cases which I have seen, success attended the attempts when the fore-arm was in a right line with the arm.

If, in a dislocation of the shoulder, the tendon of the long head of the biceps muscle is not torn from its groove in the os humeri, I should conjecture a priori, that the

* Pott's Works, vol. i. p. 468. 8vo. edit.

† Med. Obs. and Inquiries, vol. ii. p. 344.

‡ White's Cases, p. 109.

stretching of this tendon, by the extension of the fore-arm, would contribute to bring the head of the bone into contact with the glenoid cavity, as the tendon passes from the head of the bone to the neck of the scapula over that cavity. But if the tendon is torn intirely from its groove, it may be so situated as to form an impediment to the reduction, and in that case the relaxed state of the biceps muscle would be preferable. Mr. Thompson found the tendon so much removed from its place, and so much stretched by a præternatural curvature, that the fore arm could not be brought to a right line with the arm. When this is the case, it is undoubtedly proper to keep the biceps muscle relaxed during the extension.

If the fore-arm can be easily brought to a right line with the arm during the state of dislocation, and the surgeon wishes to make the extension with the fore-arm in that direction, he may still conveniently apply the extending power to the dislocated bone, and prevent any injury to the joints of the elbow or wrist, by fixing the fore-arm in an extended position, by means of a flannel roller passed round the elbow, and then applying the towels just above the condyles of the os humeri.

Opportunities of dissecting the shoulder during a state of dislocation are so rare, that we still remain ignorant of the precise nature of the injury, done to the several parts concerned, in ordinary cases. Mr. Thompson found the capsular ligament intirely torn off from the neck of the os humeri, the bone broken, and a shell of it torn off by the tendons of the supra et infra spinatus muscles. It appears also, that the long tendon of the biceps muscle was torn from its groove, though he does not expressly say so. But we can scarcely imagine that so much injury is done to the bone in every dislocation. Dr. Hunter was of opinion, from considering the structure of the joint, and from experiments made upon dead bodies, that the capsular ligament was lacerated in every dislocation of the shoulder; but he did not carry his opinion so far as to suppose that the ligament was always torn away from the neck of the

os humeri, as in Mr. Thompson's case, and as Dr. Kirkland afterwards observed in some experiments made upon brutes. It is remarkable, that no instance of dislocation of the os humeri should have been found among the great number of bodies examined by that excellent anatomist Morgagni. He mentions one instance of a luxation of the os femoris, but gives no other description of the state of the joint than that he found the round ligament relaxed.*

I once saw a compound dislocation of the os humeri, the head of the bone being pushed through the integuments in the axilla, and in that case the long tendon of the biceps was torn from its groove in the neck of the bone; the tendons of the supra et infra spinatus muscles were also separated from the bone, and had torn off a large shell of bone, as in the case related by Mr. Thompson.

Since the preceding observations were written, three cases of dislocated os humeri have occurred at the General Infirmary, in which a method of reduction was used with success, which may probably prove beneficial, when the head of the bone is found lying behind the pectoral muscle.

CASE VIII.

Henry Baldwin, aged sixty-two years, was admitted a patient of the General Infirmary, January 23d, 1801, for a dislocation of the shoulder. The head of the os humeri lay behind the pectoral muscle at a considerable distance from the glenoid cavity of the scapula. Very powerful extension, in a variety of directions, was used without success. We could not, either by vertical or horizontal extension with pullies, bring the head of the bone into the axilla. After repeated fruitless trials, I directed that eight ounces of blood should be taken from the sound arm;

* Quod ad femur attinebat, revera luxatum inventum est, laxato videlicet eo ligamento quo femoris caput intra innominati ossis acetabulum alligatur.

Epist. LVI. Art. 7.

that the patient should be put into the warm bath; that a purgative should be given, and a mild poultice applied to the shoulder till the next day.

These means removed the soreness occasioned by the extension, and the next day the patient found himself as easy as he had been before the extension was used.

As the head of the bone lay at a considerable distance from the socket, I was apprehensive that the extension of the pectoral muscle might have caused a stricture upon the neck of the bone, and thereby prevented the head from returning into the axilla. I determined therefore to try what a gentle motion of the bone in various directions, accompanied with a slight extension, would effect.

While I was using this method, without the aid of any assistant, my colleague, Mr. Chorley, who was with me, put his hand upon the head of the bone, which he could feel through the pectoral muscle, and thrust it towards the cavity of the joint. Our motions happening to correspond, the head of the bone passed easily into the axilla, and was then reduced without difficulty, two assistants making the extension while I pressed upwards the head of the bone.

CASE IX.

John Brooksbank, aged sixty, and of a thin habit, was admitted March 9th 1801, under the same circumstances. Mr. Logan, whose patient he was, after some ineffectual attempts to reduce the bone by strong extension, made use of the method which had succeeded in the preceding case. He moved the bone in various directions, while I pressed the head of it towards the glenoid cavity, into which after a few trials, it entered, and the patient was dismissed cured.

The same method of reduction was used with success in the case of a middle-aged man, who was brought to the Infirmary in December last, with a dislocation of the os humeri, the head of which lodged behind the pectoral

muscle. Pressure upon the head of the bone, assisted by gentle extension, brought it into the axilla, and the reduction was then easily effected.

It will readily be conceived, that violent extension of the muscles may often close up the space through which the head of a dislocated bone should return, when it has been driven to a great distance from its acetabulum, and when this is the case, pressure made upon the head of the bone, with moderate extension, must be a more suitable method of practice than the most violent extension.

I had used this method with success in a dislocation of the os femoris, nineteen years before the last recited cases occurred, as will be seen in the next case.

Of the Dislocation of the Os Femoris.

A dislocation of the os femoris at the hip-joint may happen two ways, either forwards and downwards, or backwards and upwards. My meaning is, that I have seen it happen in these two ways; for I leave to others the task of describing diseases which they have not seen. Instances of both these kinds of dislocation are rare. I have seen but three instances of each in a course of forty-three years' practice, though during thirty-four years of that period, I have attended an Infirmary in which cases of accident are numerous. I will describe the symptoms of both these species of dislocation, and the method of reduction used in each case, as clearly as I can; and I hope the young practitioner, whose anatomical knowledge is not defective, may obtain some useful information from these descriptions.

One case, where the bone was dislocated backwards, was of so long standing, that it was judged to be incurable. The other two cases were recent, and were treated with success in the same manner; so that the recital of one case will afford all the information that I can give on the subject.

CASE X.

In July 1782, a middle aged, and pretty strong man, was brought into the General Infirmary, who, by the fall of a waggon against him, had suffered the dislocation of the right os femoris backwards and upwards.

The inferior extremity on the affected side had an awkward appearance. It was considerably shorter than the corresponding limb. The toes were turned inwards. The thigh would not admit of a rotatory motion on its own axis. The limb could not be extended without pain to the patient. When he was laid in a prone position, the head of the os femoris might be felt through the glutæus maximus, and nearly about the centre of that muscle.

According to the best judgment which I can frame from the anatomy of the parts, I should conceive, that the head of the bone lay at the edge of the sacro-sciatic notch, near the inferior and posterior edge of the glutæus medius. In this position, as the anatomical reader will readily conceive, the head of the bone lay toward the spine, and the great trochanter towards the side of the patient. There was no apparent contusion on the hip.

To effect a reduction in this case it was evident, that the extension of the limb must be made in a right line with the trunk of the body, and that, during the extension, the head of the bone must be directed outwards as well as downwards. It appeared also, that a rotatory motion of the os femoris on its own axis towards the spine (the patient lying prone) would elevate the great trochanter, would bring it nearer to its natural position, and direct the head of the bone towards the acetabulum. These circumstances being well weighed in consultation, it was determined to proceed in the following manner:

A folded blanket was wrapped round one of the bed-posts, so that the patient, lying in a prone position, and astride of the bed-post, might have the affected limb on

the outside of the bed. The bed was rendered immovable, by placing it against a small iron pillar, which had been fixed for the purpose of supporting the curtain rods. The leg was bent to a right angle with the thigh, and was supported in that position by Mr. Lucas, who, when the extension should be brought to a proper degree, was to give the thigh its rotatory motion, by pushing the leg inwards, that is, towards the other inferior extremity. Mr. Jones sat before the patient's knee, and was to assist in giving the rotatory motion, by pushing the knee outwards at the same moment. I sat by the side of the patient, to press the head of the bone downwards and outwards during the extension. Two long towels were wrapped round the thigh just above the condyles, one towel passing on the inside of the knee, the other on the outside. Three persons made the extension; but when we attempted to give the thigh its rotatory motion, we found it confined by the towel which passed on the inside of the knee and leg. We therefore placed both the towels on the outside; and in this position the extending force concurred in giving the rotatory motion. The first effort that was made, after the towels were thus placed, had the desired effect, and the head of the bone moved downwards and outwards into the acetabulum.

The man recovered very well.

Thirty years had nearly elapsed, after the opening of the General Infirmary at Leeds, before any patient was brought to it with a dislocation of the thigh forwards and downwards. Nor had I, during a period of thirty-eight years, seen that accident in my private practice. During the year 1797, three patients were brought into the Infirmary, who had suffered this accident. Though I had never seen this disease, yet I had carefully considered it, and had determined to act, when called upon, according

to the method laid down by Dr. Kirkland, the only author who had given me any satisfactory ideas upon the subject. I communicated these ideas to my colleagues, when this case first occurred; and meeting with their approbation, a method similar to that recommended by Dr. Kirkland was pursued with success in all the patients.

In this species of dislocation, as the head of the bone is situated lower than the acetabulum, it is evident, that an extension made in a right line with the trunk of the body, must remove the head of the bone farther from its proper place, and thereby prevent, instead of assisting, reduction. The extension ought to be made with the thigh at a right angle, or inclined somewhat less than a right angle, to the trunk of the body. When the extension has removed the head of the bone from the external obturator muscle, which covers the great foramen of the os innominatum, the upper part of the os femoris must then be pushed or drawn outwards; which motion will be greatly assisted by moving the lower part of the os femoris, at the same moment, in a contrary direction, and, by a rotatory motion of the bone upon its own axis, turning the head of the bone towards the acetabulum.

Before I relate the manner in which these three motions were effected, and combined, it will be proper to describe the symptoms which indicated the existence of this dislocation. The appearance of the affected parts in all the three patients was so exactly similar, that the description of any one of them will be sufficient. The head of the bone seemed removed to a somewhat greater distance from the acetabulum in one patient, whose case I shall now describe.

CASE XI.

August 6th, 1797, Simeon Slack, aged twenty-one years, was brought into the Infirmary, on account of a dislocation of the right os femoris, occasioned by a fall from his horse. He was immediately put to bed, and

placed in the position most easy to him. I found him lying upon his back, with his right thigh stretched outwards, and resting upon a pillow, with his knee bent. Any attempt to bring the thigh nearer to a right line with the trunk of the body, gave him great pain, nor could it be brought nearer to a right line, without making a considerable extension.

The right thigh appeared much thicker than the left, at its superior and interior part. The muscles were here upon the stretch. The hollow which may usually be felt between the flexor and extensor muscles, at the upper part of the thigh, was in this case filled up. The head of the bone could not be distinctly felt through the muscles, yet from the appearance, and the touch, it was sufficiently evident, that the head of the bone lay upon the great foramen of the os innominatum. It seemed probable, that it had receded so far from the acetabulum as to be in contact with the descending part of the os pubis.

There was a considerable hollow at the upper and outer part of the thigh, where the great trochanter is usually felt projecting.

The right thigh appeared to be three or four inches longer than the left.

The foot of the affected limb was not turned outwards with respect to the knee, but maintained its usual relative position.

The following method of cure was put in practice with success:

The lower bed-post, on the right side of the bed on which the patient lay, was placed in contact with a small immovable iron pillar (about an inch square in thickness), such as in our wards are used for supporting the curtain rods of the beds. A folded blanket being wrapped round the bed-post and pillar, the patient was placed astride of them, with his left thigh close to the post, and his right thigh on the outside of the bed. A large piece of flannel was put between the blanket and the scrotum, that the latter might not be hurt during the extension.

The patient sat upright, with his abdomen in contact with the folded blanket which covered the bed-post. He supported himself by putting his arms round the post, and an assistant sat behind him to prevent him from receding backwards. He was also supported on each side.

Two long towels were put round the lower part of the thigh, in the manner before described, after the part was well defended from excoriation by the application of a flannel roller. The knot, which the towels form, was made upon the anterior part of the thigh, that the motion intended to be given to the leg might not be impeded by the towels.

The thigh being placed in a horizontal position, or rather a little elevated, with the leg hanging down at right angles to the thigh, I sat down upon a chair, directly fronting the patient, and directed a gentle extension to be made by the assistants standing at my left side. This was done with the view of drawing the head of the bone a little nearer to the middle of the thigh, and the extension had this effect. I then placed the two assistants, who held the towels, at my right side, by which means the extension would be made in a direction a little inclined to the sound limb. Mr. Logan stood on the right side of the patient, with his hands placed on the upper and inner side of the thigh, for the purpose of drawing the head of the bone towards the acetabulum, when the extension should have removed it sufficiently from the place in which it now lay.

I desired the assistants to make the extension slowly and gradually; and to give a signal when it arrived at its greatest degree. At that moment Mr. Logan drew the upper part of the bone outwards, while I pushed the knee inwards, and also gave the os femoris a considerable rotatory motion, by pushing the right leg towards the left. By these combined motions the head of the os femoris was directed upwards and outwards, or, in other words, directly towards the acetabulum, into which it entered at our first attempt made in this manner.

The scrotum, as the patient assured me, was not hurt in the least by the extension.

The other two patients, who were brought to the Infirmary in March preceding, had been treated on the same principle, but every step in the operation was not so distinctly marked. The first was a boy, whose thigh was reduced while he sat upright, and astride of the bed-post. The second was a man twenty-seven years of age, who was not brought to the Infirmary till the sixth day after the accident. A bone setter had been sent for the day after the accident, who used great force by the assistance of eight or nine men, as the patient informed us. But as he made the extension in a right line with the trunk of the body, he failed of success. The patient was rendered so sore by the extension, that he could not bear to be removed till the fifth day afterwards.

I placed this patient in a supine posture, upon a bed laid on the floor. The extension was made by a single person, who stood upon a chair, and held the thigh in a vertical position, or rather somewhat inclined towards the patient's abdomen. The motions given to the os femoris were nearly similar to those which I have described, and effected the reduction. The patient was able to walk about the ward without crutches, before the expiration of a week.

In all the three patients the affected limb, immediately after the reduction, was longer than the sound limb; but gradually regained its proper length.

Of the Dislocation of the Lower Jaw.

The practical observations which I have to make on the treatment of this disease are few; but they may be of some use to the young practitioner.

One of the condyles of the lower jaw is often dislocated while the other remains in its proper place, and it is not

always easy to know when this is the case. One would expect, from a consideration of the structure of the parts, and from the description given in systems of surgery, that the chin should be evidently turned towards the opposite side; but I have repeatedly seen the disease when I could discern no alteration in the position of the chin. The symptom which I have found to be the best guide in this case, is a small hollow which may be felt behind the condyle that is dislocated, which does not subsist on the sound side. If the surgeon proceeds in the treatment of this partial dislocation, as if it had taken place in both condyles, he will throw an impediment in the way of the reduction, and perhaps will be foiled in his attempts.

The method of reduction recommended by some of our best writers on surgery is, first to pull the jaw forwards till it moves somewhat from its situation, and then to press it forcibly downwards, and moderately backwards. The first part of this process does not appear to me necessary from theory, and in practice I have found it useless, to say the least. I have succeeded the best by simply pressing the lower jaw downwards, and backwards, with my thumbs placed as near the angles of the jaw as possible.

If both sides of the lower jaw are pressed upon, while one side only is dislocated; the reduction of the dislocated condyle is rather prevented. It is the best method, therefore, to examine carefully whether both the condyles are dislocated, before any attempt is made, and to apply the force to that side of the jaw only which has suffered dislocation. I am inclined to think, that the application of pressure to one side of the jaw at once will not be injurious, even when both condyles are dislocated, having repeatedly succeeded with ease in a complete dislocation, by reducing the condyles singly, after I had made an unsuccessful effort to reduce them both at the same time.

I have known two persons in whom this dislocation frequently happened. Not only yawning, but even opening the mouth incautiously in eating would cause it.

Of the Dislocation of the Thumb.

A peculiar difficulty attends the reduction, when the head of the metacarpal bone, which is joined to the first phalanx of the thumb, is luxated completely, and depressed towards the palm of the hand. A dislocation in the opposite direction is easily reduced.

A tranverse section of the anterior extremity of the metacarpal bone exhibits the form of a wedge, the narrowest part being towards the palm of the hand. There are two tubercles on each side of the anterior extremity of the metacarpal bone, whence the lateral ligaments go off in part to the first phalanx of the thumb. Upon measuring the distance of these tubercles from each other, I have found those two tubercles which are nearest to the palm of the hand, to be only $\frac{3}{8}$ ths of an inch from each other, when the tubercles on the posterior part of the same bone were at the distance of $\frac{5}{8}$ ths of an inch. Supposing therefore the head of the metacarpal bone to be pressed forcibly between the lateral ligaments towards the palm of the hand, the extremity of the metacarpal bone passes like a wedge between the lateral ligaments, and having passed through between them, it cannot return, as the posterior broad part of the bone presents itself to the more contracted aperture between the ligaments. From an anatomical consideration of the structure of this joint, it seems impossible that the metacarpal bone should pass in this direction to a complete dislocation, without tearing off some part of the lateral ligaments; yet so much of the ligaments may remain, as to prevent the return of the bone to its natural situation.

Whether these observations account for the difficulty of reduction in this species of dislocation, or not; I know from experience, that the reduction is in some cases extremely difficult, if not impracticable.

When I was a pupil at St. George's Hospital in the year 1758, a patient, who had suffered a dislocation of the

thumb, was dismissed incurable, the surgeons, who were men of the greatest eminence, not being able to effect the reduction. Mr. Bromfeild then informed the pupils, that he had known a surgeon increase the force of extension to such a degree, in attempting reduction in this dislocation, that he tore off the thumb at the second joint.

In the year 1767, Mr. Billam, at that time a surgeon in Leeds of considerable experience, came to my house with a young man, who by falling against a stone had dislocated the metacarpal bone of the thumb, in the manner above described. Mr. B. had attempted the reduction in vain, and we had jointly no better success. We tried not only by extension, accompanied with pressure upon the dislocated extremity of the bone, but also, by giving the bone a kind of rotatory motion on its own axis; but all in vain. This case led me to examine the joint attentively, both in the skeleton, and in a preparation of the joints kept in spirits; and caused the observations which I have noted above.

I was lately called to an accident of this kind, and being foiled in my first attempts to reduce the bone, I desired the patient to keep her hand in a mild poultice for several days, intending to repeat my attempts. But the patient would not suffer me to make another trial; satisfying herself with putting a cover of leather upon her thumb. Whether she had made application to any other surgeon after my first failure, I do not know.

CHAPTER VI.

ON INTERNAL DERANGEMENT OF THE
KNEE JOINT.

THE joint of the knee is so firmly supported on all sides by tendinous and ligamentous substances; that the bones of the thigh and leg are very rarely separated from each other, so as to form a *dislocation*, in the common sense of the term. Great violence must take place, and a considerable laceration must happen, before the tibia can be completely separated from the os femoris. Yet this joint is not unfrequently affected with an internal derangement of its component parts; and that sometimes in consequence of trifling accidents. The disease is, indeed, now and then removed, as suddenly as it is produced, by the natural motions of the joint, without surgical assistance: but it may remain for weeks or months, and will then become a serious misfortune, as it causes a considerable degree of lameness. I am not acquainted with any author who has described either the disease or the remedy; I shall, therefore, give such a description as my own experience has furnished me with, and such as will suffice to distinguish a complaint, which, when recent, admits of an easy method of cure.

This disorder may happen either with, or without, contusion. In the latter case it is readily distinguished. In the former, the symptoms are equivocal, till the effects of the contusion are removed. When no contusion has happened, or the effects of it are removed, the joint, with respect to its shape, appears to be uninjured. If there is any difference from its usual appearance, it is, that the

ligament of the patella appears rather more relaxed than in the sound limb. The leg is readily bent or extended by the hands of the surgeon, and without pain to the patient: at most, the degree of uneasiness caused by this flexion and extension is trifling. But the patient himself cannot freely bend, nor perfectly extend the limb in walking; but is compelled to walk with an invariable and small degree of flexion. Though the patient is obliged to keep the leg thus stiff in walking; yet in sitting down the affected joint will move like the other.

The complaint which I have described may be brought on, I apprehend, by any such alteration in the state of the joint, as will prevent the condyles of the os femoris from moving truly in the hollow formed by the semilunar cartilages and articular depressions of the tibia. An unequal tension of the lateral, or cross ligaments of the joint, or some slight derangement of the semilunar cartilages, may probably be sufficient to bring on the complaint. When the disorder is the effect of contusion, it is most likely that the lateral ligament on one side of the joint may be rendered somewhat more rigid than usual, and hereby prevent that equable motion of the condyles of the os femoris, which is necessary for walking with firmness.

The method of cure, which I am about to propose, must not be used while there is any inflammatory affection, or swelling of the joint; but only when these effects of contusion are removed. The following cases will farther illustrate the nature of this complaint; and point out the method which I have hitherto found successful in removing it.

CASE I.

In 1782, I was desired to visit the late William Sotheron, Esq. of Darrington; and found him affected with an inability of moving the joint of one knee. This complaint came upon him suddenly, the morning of the day preceding my visit, as he was turning himself in bed. He felt

some pain at the insertion of the tendon of the biceps femoris into the head of the fibula; and that tendon seemed to be rather upon the stretch; in other respects the appearance of the joint was perfectly natural. As Mr. S. was then in an emaciated state from other complaints, I had an opportunity of examining the joint to the greatest advantage. There was no swelling in any part of it. I could bend and extend the affected limb as readily as that which remained uninjured. There was no protrusion of the femilunar cartilages. My patient felt no pain when I pressed my fingers upon the joint in any direction. He informed me, that he had twice before had a similar lameness, which at both times had left him instantaneously. He was chiefly uneasy at the continuance of this attack.

He had occasion to walk out of the room soon after my arrival; and I then observed, that he could not place his foot flat upon the floor, nor bend the joint as usual when he raised the affected limb in walking.

Soon after his return into the room, while he stood talking with me, he cried out on a sudden, "I am quite well," and immediately was able to walk about without the least degree of lameness.

CASE II.

In 1784, the honourable Miss Harriet Ingram (now Mrs. Aston), as she was playing with a child, and making a considerable exertion, in stretching herself forwards, and stooping to take hold of the child, while she rested upon one leg, brought on an immediate lameness in the knee joint of that leg on which she stood. The disorder was considered as a simple sprain; and a plaster was applied round the joint. As the lameness did not diminish in the course of five or six days, I was desired to visit her.

Upon comparing the knees, I could perceive no difference, except that, when the limbs were placed in a state of complete extension, the ligament of the patella of the

injured joint seemed to be rather more relaxed than in that joint which had received no injury. When I moved the affected knee by a gentle flexion and extension, my patient complained of no pain; yet she could not perfectly extend the leg in walking, nor bend it in raising the foot from the floor; but moved as if the joint had been stiff, limping very much, and walking with pain.

I thought it probable, that the sudden exertion might in some degree have altered the situation of the cross ligaments, or otherwise have displaced the condyles of the os femoris with respect to the semilunar cartilages; so that the condyles might meet with some resistance when the flexor or extensor muscles were put into action, and thereby the free motion of the joint might be hindered, when the incumbent weight of the body pressed the thigh bone closely against the tibia; though this derangement was not so great as to prevent the joint, when relaxed, from being moved with ease.

To remedy this derangement, I placed my patient upon an elevated seat, which had nothing underneath it that could prevent the leg from being pushed backward towards the posterior part of the thigh. I then extended the joint by the assistance of one hand placed just above the knee, while with the other hand I grasped the leg. During the continuance of the extension I suddenly moved the leg backwards, that it might make as acute an angle with the thigh as possible. This operation I repeated once, and then desired the young lady to try how she could walk. Whatever may be thought of my theory, my practice proved successful; for she was immediately able to walk without lameness, and on the third day after this reduction she danced at a private ball without inconvenience, or receiving any injury from the exercise.

CASE III.

In October 1786, the young lady, who is the subject of the last case, had the misfortune to produce the same

injury in her knee, in rising hastily out of bed. After the lameness had continued about a week, without any amendment, I was consulted. The method of cure above described was made use, with the same immediate success.

CASE IV.

Master Thompson of Hull, a young gentleman at Mr. Hodgson's academy in Leeds, suffered a contusion and sprain of the knee joint, by climbing up behind a post-chaise in motion, the wheel of which caught hold of his leg, and gave it a severe twist. I saw him a few hours after the accident. The joint was swelled, and in a very painful state. I directed him to be put to bed; and used such remedies as I judged most likely to prevent inflammation. The swelling and pain soon went off; so that he was able, at the expiration of a week, to move about. A plaster was then put round the joint, and he was permitted to walk out.

From this time there was no improvement in the motion of the joint. He could run, but it was in a very awkward and imperfect manner, for he could not set his foot flat upon the ground. He was obliged in walking to rest upon his toes whenever he raised the sound limb from the ground, and to keep the knee a little bent, being incapable of extending the limb in a progressive motion. A person, observing the manner in which he performed this exercise, would have thought his knee to be stiff; yet there appeared to be no rigidity in the joint, when it was moved by the hands of another person, while he himself sat in a chair.

When he had remained in this state nearly a fortnight, without any amendment, I was persuaded that the condyles of the os femoris were prevented from moving in a true direction upon the tibia and semilunar cartilages, either by some irregular contraction of the tendinous or ligamentous substances surrounding the joint, or by some other cause of internal derangement, which time might

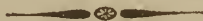
rather increase than remove. I determined, therefore, to attempt his relief by the method above-mentioned. I extended, and then bent the limb to a considerable degree, repeating the operation two or three times. He was enabled immediately to walk in a natural manner, and in a few days regained the perfect use of his limb.

CASE V.

In October 1790, the Rev. Thomas Dikes of Hull, who then lived at Berwick in Elmet near Leeds, suffered a contusion of the knee, by the fall of his horse, as he was riding. The cuticle was rubbed off in some places. A violent pain was brought on, which continued in the knee for about an hour and half after the accident; and the joint during this time became swelled and discoloured. In the course of a week the swelling subsided. The *ceratum saponis* was then put round the knee, and he was permitted to walk a little. At the expiration of a month after the accident, his power of walking was not at all increased, yet the injured knee appeared like the other. I could bend and extend the limb without difficulty, and without giving him pain; but when he walked he could give the joint no motion by the natural efforts of the muscles. He walked, to use his own expression, "as if he had no joint in the knee."

These symptoms led me to hope that I might be of service to him by the extension and flexion which I have described. But as the joint had remained so long without its proper use, I could scarcely flatter myself with the expectation of immediate success. I extended and bent the limb with rather more force than I had used in the preceding cases; yet upon the first trial he could not use the joint so well as I wished. I repeated the operation after the interval of a few minutes, and he immediately regained the power of walking as well as usual, except that he felt a little weakness for a few days.

I have seen several cases of this disease besides those above described; but the symptoms and treatment being similar, I shall not trouble my reader with a recital of them.



CHAP. VII.



ON LOOSE CARTILAGINOUS SUBSTANCES IN THE JOINTS.

THE existence of loose cartilaginous substances in the joint of the knee, has been noticed by several modern authors. The method of extracting these substances, and that of treating the patient after the operation, have been described by Mr. Bromfield in the Appendix to his first volume of *Chirurgical Observations*; and by Mr. Ford in the fifth volume of *Medical Observations and Inquiries*. This operation is considered by these authors as the only method of cure. But, although it has often been attended with success, yet, as the late *Medical Society* have observed, it has sometimes "been followed with violent inflammation, fever, and death itself." It would therefore be of service to mankind, could a method be invented of curing this disorder with safety, or rendering it of no inconvenience to the patient.

Such a method I have found, in a few instances, in the use of a well-adapted laced knee-cap. And as in one of these instances the disease was more than usually troublesome, I think I do not exceed the bounds of probability

in hoping, that it will generally prove successful; at any rate, it deserves a trial before the dangerous operation of opening the joint is attempted: especially as there is reason to believe, that, in some cases, loose cartilaginous substances, or substances resembling them, are capable of becoming dissolved in the joint, without the assistance of any remedies.

CASE I.

In October 1781, Mr. Snowden, an apprentice to a linen-draper in Leeds, consulted me on account of a loose hard substance, which he had lately felt in the joint of the knee. It seemed to be about the size of a hazel-nut. It passed very readily from one part of the joint to another upon a gentle pressure, and during the ordinary motions of the limb. He became sensible of the existence of this loose substance in the joint soon after his recovery from the effects of a contusion of the knee, which he had suffered from a fall; before which accident he had not the least complaint in the part.

While this substance remained in the interior parts of the joint, he could walk without inconvenience; but whenever it got between the condyles of the os femoris and the tibia, so that he could feel it through the capsular ligament, it gave him pain, and produced lameness.

These circumstances induced me to think, that the application of a knee-cap, laced closely, might retain the substance within the interior parts of the joint; or, at least, prevent it from remaining so long between the condyles of the os femoris and the tibia, as to create much uneasiness. The utility of this bandage exceeded my expectation: for he not only found no inconvenience from the moveable substance after he began to wear the knee-piece; but at the expiration of twelve months he assured me, that he was no longer sensible of the existence of the disease, even when he walked without his bandage.

CASE II.

October 26th, 1781, Mr. Brigham, house-steward to the late General Cary, consulted me on account of two loose substances in the joint of the knee, which rendered him unable to go about his usual employment, without considerable difficulty and pain. He informed me, that, about two years before, he had the misfortune to slip down a declivity in the front of Leven-grove house, the seat of General Cary; and thereby received so violent a sprain in his knee, that he was for a time unable to walk. When the immediate effects of the sprain were removed, he first perceived the substances in the joint. A variety of applications were made use of to relieve his lameness; and the application of a caustic was recommended for the removal of the loose substances; but to this proposal he would not consent. He had no degree of lameness or weakness in the knee, previous to the accident I have mentioned; but was stout and active.

Upon examining his knee, I found two loose and hard substances within the capsular ligament. They moved rapidly, upon pressure, from one part of the joint to another. I could sometimes feel them both at the same time; but never found them in contact with each other. There was also a smaller cartilaginous substance (so I judged it to be) attached to the exterior part of the tendon of the vastus externus femoris. This was also moveable to a certain distance, and seemed to be situated on the outside of the capsular ligament. These substances incommoded him so much upon motion, that he was frequently compelled to stop in walking; and the pain which they caused was often so acute, as to make him cry out.

I found it more difficult to restrain the motion of the loose substances in this case, than in that of Mr. Snowden; and therefore procured a *quilted* knee-piece, which was made under my inspection. I took an exact measure of

the knee; and made the quilting to project in two places, where the knee-piece was to press upon the hollow part of each side of the patella: for there the substances usually made their appearance. I advised Mr. Brigham to wear also compresses of plaster spread upon leather, on each side of the patella, if the quilting should not sufficiently restrain the motion of the loose cartilages.

General Cary informed me, in April 1784, that Mr. Brigham, though not perfectly well, could walk about with ease, and even run, and leap, without injuring himself, or usually exciting pain. Wishing to know the issue of this case, I wrote to Mr. Brigham, requesting him to inform me of the present state of his knee. In his answer, dated August 1st, 1791, he gives me the following account:

“ After I had worn your bandage a few days, laced very tight, I found my knee near perfectly well; and when I keep the bandage tight it continues so still, and has done ever since I was with you at Leeds: but I can find the lumps not at all reduced, though they are no hindrance to me in any common exercise. But before I made use of the bandage, I was not able to walk without the assistance of either crutch or stick.”

In January 1792, Mr. Brigham called upon me at Leeds. He had ceased wearing the quilted bandage for several years, and now wore only a common laced knee-cap. The substances produced no impediment in walking, and were now seldom perceived. After a trial of ten years he had found this mode of treatment to answer every purpose he desired.

CASE III.

August 1788, Mr. Lee, of Leaconfield-park, near Beverley, consulted me, and gave me the following account of his complaint:

About three months before his application to me, he received a violent stroke from a horse, upon his knee;

which caused a considerable swelling of the joint. Three or four weeks after this accident, when the swelling was dispersed, he perceived a small moveable substance in the joint, which gave him great uneasiness in walking. He consulted a surgeon of eminence in the neighbourhood, who advised the extraction of the substance, as the only method of cure.

Being apprehensive that the operation would be attended with some degree of danger, he was unwilling to submit to it without the concurrent opinion of some other surgeon.

I recommended the use of a laced knee-piece; from which he found such relief, that he could immediately walk with ease and firmness.

September 20th, 1791, Mr. Lee called upon me in his road to Buxton, and informed me, that he had continued to wear the knee-piece till within the last month; when the rheumatism affecting his knee as well as some other joints, had rendered the wearing of the bandage painful. He had not felt the loose substance for about two months before he left off the use of his bandage; nor had he felt it since the bandage had been removed.

CASE IV.

Being at York upon business, I was requested by the late Rev. Mr. Cappe, to examine the elbow of Mr. W. Lee, of Leeds, who was then under his tuition. This young gentleman had hurt the joint considerably by a fall in the street, betwixt five and six weeks before I saw him. I did not see the surgeon who had attended him; but was informed, that the extremity of the Olecranon was supposed to have been broken off, from the existence of some loose substances, which were discovered in the joint upon the subsiding of the swelling caused by the contusion.

Upon examination I could readily feel two loose, hard, and roundish substances in the joint. The swelling being

entirely dispersed, I could also distinctly feel the extremity of the Olecranon; and was persuaded, that the substances which I found in the joint were not pieces of bone broken off from that process. Mr. Lee could move the arm with freedom, and was not much incommoded by these substances.

The substances gradually diminished; and at last became entirely dissolved, as I should suppose, for they could not be felt in any position of the joint.

I cannot ascertain the period of the dissolution, as I very rarely examined the joint; and as several years intervened between my first and last examination of it.

REMARKS.

When the preceding cases occurred, I had not seen Reimarus's Thesis *De Fungo Articulorum*; nor did I know, that bandages had been tried, and had been found useful in some instances for this complaint. The late Mr. Middleton, serjeant-surgeon to the army, informed Reimarus, that he had cured a patient by the application of plaster and bandage to the knee; so that upon removing the bandage, after it had been applied some months, the disease did not return. Mr. Middleton knew another case in which the same treatment had proved successful. But it is added, what I ought not conceal, that the same method had been tried in St. George's hospital without success, in one instance; in which the pain was increased while the substance was kept under the patella, although the patient had before found relief from this treatment. The substance was therefore removed by incision into the joint.*

These loose substances differ somewhat in their structure. Some have been found upon examination to be small bones, covered with a crust of cartilage; while others have been found cartilaginous throughout.

* See Reimarus de Fungo Articulorum, § 27, 54, &c.

The origin of these substances remain yet obscure. Mr. Ford thinks it most probable, that in his patient, "the cartilage was primarily attached by small ligaments to the joint, but at length increasing in bulk, it was separated from its attachment by the injury received in the fall."* In one instance, mentioned by Reimarus, some disease seems to have existed in the joint before the patient suffered that contusion of the knee, which was followed by the perception of a loose substance.

"Æger ille in Nosoc. Georg. licet in eodem genu dolorem aliquem jam a tribus annis senserat, accedente et a multo motu tumore; hæc tamen gravia non fuisse, nec corpusculum illud omnino se percepisse aiebat antequam genu læserit." Ib.

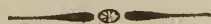
In those instances which have occurred in my practice, the patients had neither the least degree of lameness, nor of weakness in the knee, prior to the injuries which they suffered in the joint. And this seems to have been the case in almost all the instances which have been published, where any notice is taken of the patient having suffered an injury in the joint.

As dissections of the knee have sometimes discovered the existence of cartilaginous substances, attached to the interior parts of the joint by small pedicles; and as these substances, when loose, may be so confined within the joint as to create neither pain nor lameness; the idea of their being *detached*, rather than caused to exist, by the accidents which have preceded the perception of them, seems very rational. On the other hand, as the causes of the generation of these morbid appendages of the joints is totally unknown to us; and as they have so often been first perceived after the joint had suffered some considerable contusion; it is not improbable, that in some cases the morbid state of the joint, after such contusion or other injury, may give rise to their production. This seems to have happened in the 4th of the preceding cases.

* Medical Obs. and Inquiries, vol. 5. p. 329.

If any case should occur, in which the patient can obtain no relief from a well-adapted bandage; but is under the necessity of submitting to the extraction of the loose substance, the surgeon ought to attend to the advice given by the late *Medical Society*, in the postscript to Mr. Ford's paper on this subject.

“ Besides such chirurgical management as may be
“ thought best for keeping the lips of the wound in perfect contact, the limb should be kept immovable, and
“ every thing should be avoided than can either irritate
“ the part, or heat the body.”



CHAPTER VIII.



ON WOUNDS OF THE JOINTS.

THE operation proposed for extracting loose cartilaginous substances from the joint of the knee, leads me to offer a few remarks on wounds of the joints, a subject of considerable importance in the practice of surgery. The observations of the Medical Society, above quoted, very judiciously point out the danger of such wounds, and the proper treatment for preventing the bad consequences which often arise from them.

The utmost care should be taken in these cases to prevent inflammation. Upon this circumstance chiefly depends a successful termination. I have seen many large wounds of the great joints healed without the superintention of any dangerous symptoms, where due care has been taken to prevent inflammation; while injuries, apparently

trifling, will often be followed by a train of distressing and dangerous consequences, where such care has been neglected. It is generally easier to prevent inflammation in the joints, after a wound, than to arrest its progress when once begun. I speak now of inflammation affecting the capsular ligament. A slight degree of redness and tenderness in the integuments only is of little consequence; but when the capsular ligament becomes inflamed, the formation of abscesses, attended with a high degree of fever, and ultimately a stiffness of the joint, are the common consequences, if the life of the patient is preserved. The recital of a few cases will illustrate this subject, and point out the great advantage of timely care to prevent inflammation when a joint is wounded.

CASE I.

In 1787, Mr. Hargrave, a joiner and master-builder in Leeds, happened to fall, as he was walking up some steps into his ware-house, and to strike the end of his thumb against one of the steps. By this accident he suffered a compound dislocation of the last joint of his thumb. He immediately replaced the bones, which returned to their proper situation with ease. Finding no great degree of pain after the reduction, and not aware of any bad consequences from a wound of the joint, he did not immediately apply for any surgical assistance. He wrapped a linen rag round the thumb, and continued to go about his business, hoping that the wound would soon be healed. The next day he covered his thumb with cerate, and remained free from any considerable degree of pain till the evening. Inflammation now began to take place, which soon occupied the whole of his hand, and extended along the fore-arm up to the elbow. In this state of the disease I was consulted; but it was too late to prevent a high degree of inflammation, accompanied with much symptomatic fever, and the formation of several large abscesses in the fore-arm, along the course of the

lymphatics. Notwithstanding the use of bleeding, purgative and other cooling medicines, the application of the mildest poultices, with a strict attention to rest, and a horizontal position of the limb, the fever ran so high that he was sometimes a little delirious. As the abscesses were chiefly formed beneath the fascia of the muscles, I made incisions through the fascia wherever I could perceive a fluctuation of matter. These operations diminished the tension of the limb, abated the fever, and seemed to be the means of preserving the life of my patient. I was obliged to make seven incisions (some of them large) at different times, in the fore-arm, and two on the back part of the hand. Upon his recovery, however, no injury remained, except a stiffness of the last joint of the thumb, which had suffered the compound dislocation.

CASE II.

In 1767, I was desired to visit James Oakes, aged thirty years, who, in cutting some wood, which he held against his knee, with a sharp semi-circular knife, such as the coopers use, had divided the ligament of the patella, and a portion of the capsular ligament on each side of the patella. The accident had happened some weeks before I saw him. I found the knee swelled, somewhat inflamed about the internal condyle of the thigh, and very painful. The leg, though now kept constantly in a horizontal position, was œdematous.

Mr. B. who was attending him, had introduced a seton at the external part of the wound, and had drawn it through an opening made on the outside of the thigh, a little above the external condyle, for the purpose of affording a free discharge to the matter of an abscess formed there. His pulse was very frequent, and he was obliged, on account of the pain, to take sixty or seventy drops of laudanum every night, which did not, however, procure much rest.

There was no apparent inflammation in the ham, when I first saw him, but in the course of a few days an abscess began to form itself there, which was opened as soon as the part became sufficiently prominent. The purulent matter which was discharged, was dark coloured, and very fetid. After this opening, the swelling of the leg abated, and the matter, having a free exit, became better conditioned. The matter insinuated itself somewhat beneath the integuments of the leg and thigh; but by an enlargement of the wound, and the application of rollers, the extension of the matter was prevented.

The painful state of the joint, and the symptomatic fever abated. Before the expiration of January, his pulse was come down to ninety, and he slept moderately in the night-time, sometimes without an opiate. The seton was removed, and he was now permitted to sit up every day.

February 11th, his pulse was at sixty-two. The wounds after this time healed favourably, but a stiffness of the joint remained.

CASE III.

In 1784, a stout young man was brought into the Infirmary at Leeds, with a transverse wound penetrating the knee joint just above the patella. Mr. Lucas had the care of the accident-patients this week; but as he was out of town, I was requested to attend to this case.

The patient had been working in the woods, and, a woodman's bill had fallen from a bough above him, and striking the lowest part of the thigh, had made a transverse wound about two inches in length, dividing the tendon of the rectus femoris close to the patella. A wound was made through the capsular ligament, so large that I could easily introduce my finger into the joint.

After examining the interior parts of the joint with my finger, that no extraneous body might be left there, I united the lips of the wound by three stitches of the interrupted suture, taking care to lay hold of nothing with

the needle but the integuments. I could not remove all the blood from the inside of the joint, for that continued to flow as long as my finger remained in the wound. Neither could I favour the discharge of that blood which remained in the joint, by any method of placing the limb which would answer my principal intention. But I hoped that, if inflammation could be avoided, the extravasated blood would be absorbed without danger.

That I might keep the knee quite steady, and the injured parts in a state of relaxation, I placed the man in a supine posture, with his leg upon a pillow in a heavy fracture-box, and covered the wound with ceratum saponis, spread upon a pledget of tow. This method kept the anterior parts of the knee, with the rectus femoris, in a state of the greatest relaxation; and the external air was excluded without making any pressure upon the injured parts, I gave directions that all possible care should be taken to prevent the motion of the joint upon any occasion.

The patient complained of smarting in the wound for about half an hour after the dressing, but had afterwards no return of pain.

Mr. Lucas continued the same treatment, and cut out the ligatures upon the tenth day after the accident. The patient recovered so well, that in the space of four weeks he became able to move about in the ward upon crutches.

He regained the perfect use of his limb.

CASE IV.

October 4th, 1798, Sarah Swordie, aged eighteen years, was brought into the Infirmary, on account of a wound in the elbow-joint, which she had just received from the wadding of a pistol, fired very near her, during the rejoicing for Admiral Nelson's victory over the French fleet, in the Bay of Aboukir. The wound was made near the olecranon, through the flat tendon of the extensor cubiti.

The parts were contused and lacerated. The capsular ligament was divided so as to admit readily the introduction of a finger within the joint. A considerable number of grains of gun-powder were lodged in the integuments. I examined carefully the cavity of the joint, but could not find any extraneous substance lodged there.

Though it was not probable, from the contused state of the parts, that an union by the adhesive process could be obtained; yet, in order to diminish as much as possible the size of the wound, and exclude the external air, I drew the integuments into contact by some stitches of the interrupted suture. The young woman being put to bed, I placed the arm upon a pillow, in an extended position, that the wounded parts might be kept in a state of relaxation. The arm was covered with a poultice made of bread and water. An opiate was given immediately, and a gentle laxative the next morning. The young woman was not suffered to get out of bed on any occasion, nor was her arm removed from the pillow except when gently raised for the purpose of applying the poultice.

The symptoms of inflammation were trifling, and soon went off. The integuments had been so much contused, that the ligatures did but retain the wounded parts in contact for a few days. The edges of the wound then sloughed off, but the size of the wound was diminished by the lips having been retained in contact for some days. The arm became quite easy in the course of a few days.

On the 14th day I laid aside the poultices, and drew the lips of the wound towards each other with sticking plaster.

The patient regained the perfect use of the elbow; and December 5th was discharged cured.

CASE V.

William Hide, aged twenty-one years, was brought into the Infirmary, May 9th, 1799, on account of a wound

which he had just received in the ankle-joint by a hatchet. The stroke had been given in a perpendicular direction; and the instrument had not only divided the capsular ligament, but had also cut off a portion of the articular extremity of the tibia, about an inch in length and half an inch in breadth; and a smaller portion from the edge of the astragalus. I dissected out the former; but the latter lay so deep in the wound, and was so strongly attached to the soft parts, that I judged it to be the most prudent measure to leave it in the wound, as I should not have been able to take up any blood-vessel that might have been wounded in the dissection. Besides, the attachment of this small piece of bone to the soft parts was so strong, that I was under no apprehension of its being cast off, or becoming injurious to the joint. The integuments were united by future, and the limb was placed in the most easy position in bed, after being covered with a mild poultice.

The future treatment of this patient was committed to Mr. Logan, in whose absence I had taken care of him, who placed the limb in a fracture-box upon the third day after the accident. The inflammation was trifling. The poultice was continued about a fortnight. At the end of the third week the patient was allowed to sit up, the wound being nearly healed; and at the expiration of the fourth week the wound was completely cicatrized. He was now directed to move the joint, and to walk a little; but by too great exertions he brought on an inflammation about the joint. Rest, with the repeated application of leeches, and the aq. litharg. acet. comp. removed the inflammation.

June 24th, he was made an out-patient, and was soon after that discharged cured.

CASE VI.

Gervase Hodgson, a little boy, about five years of age, playing in the fields at the time of harvest, received a

wound from a scythe, which divided the capsular ligament of the ankle-joint, and took off a small piece of bone on the inner side of the extremity of the tibia. He was brought to the Infirmary, and fell under my care. I united the divided integuments by future, taking care to avoid any puncture of the capsular ligament. The limb was wrapped in a poultice, and the patient confined to his bed. The integuments became inflamed, and the futures burst open. An abscess was formed on the opposite side of the ankle, the opening of which gave him great relief. It was about two months before the wounds were healed, but he regained the perfect use of his ankle.

CASE VII.

John Senior, aged nine years, was admitted into the General Infirmary May 2d 1801, on account of a contused and lacerated wound in the right arm. He was following a large iron roller, drawn by a horse, in the fields, and was holding a rope in his hand, which happened to become entangled with the roller while in motion, in such a manner that his arm was suddenly drawn beneath the roller. A large wound was made in the elbow-joint and the arm, both of which had suffered great contusion. The capsular ligament of the joint was laid open; and the articular extremity of the os humeri was broken obliquely upwards, so that the greater part of the internal condyle of the bone was separated from the external, in the hollow which lies between these two projections.

As the external condyle of the os humeri, and the bones of the fore-arm remained uninjured, as the great blood vessels were entire, and the muscles had not suffered any considerable laceration, I determined to attempt the preservation of the limb. I first dissected out all the broken pieces of bone, and after placing the integuments in their natural situation, I united them by the interrupted future. I wrapped the arm in a poultice of bread and water, and placed it in the most easy position upon a pillow in bed.

The limb was kept in this position, except when elevated for the purpose of applying the dressings.

The contusion had been so great, that the integuments were cast off on the inner side of the arm, from one to two inches in breadth, from the elbow to the axilla, but no inflammation ensued. The boy was quite easy, except during the times of dressing the wound. A sinus was formed under the integuments at the axilla, which I was obliged to open. The use of the poultice was continued till the tumefaction of the limb had completely subsided and the wound was filled with granulations.

At the expiration of five weeks he was able to walk about the house. He was made an out-patient July 10th, and in August was discharged cured.

After the boy was made an out-patient, the granulations became spongy, and somewhat foul, and the wound seemed indisposed for cicatrization. In this state he received great benefit from the following application, which is often singularly useful in scrofulous sores, when the granulations are spongy.

R. Aq. puræ ℥ xv.

Spt. Rorismarin. ℥ j.

— Lavend. c. 3 j.

Zinci vitriolat. 3 fs. fiat Solutio.

The sores were kept constantly covered with folded linen wet with this solution, without any other dressing. It was applied afresh three or four times a day.

CASE VIII.

I was desired by Mr. Wormald, surgeon, who now resides at Harrowgate, to visit the son of John Baraclough, of Adwalton, and to take with me every thing necessary for the amputation of his arm.

A cart, in which the child was riding to the hay field, had been overturned, and its upper edge falling upon his

right arm, had cut the elbow joint quite across, on the anterior side, and had broken the inferior part of the os humeri transversely, about an inch and half above its articular extremity. Below this fracture the end of the bone was also broken in different directions. The extensor muscles were not injured, and there remained so large a portion of the flexors undivided, that I thought the boy might enjoy a considerable use of his arm, if the wound in the joint could be healed.

I dissected out the whole extremity of the os humeri from the part where it had suffered the transverse fracture, and after bringing the integuments into contact, I placed the limb gently bent at the elbow upon a pillow, and surrounded with a mild poultice.

The symptoms consequent upon this accident and operation were extremely favourable. No inflammation supervened. The boy recovered, and was able to perform the motions of flexion and extension with his arm, though the joint which had suffered so great a loss was not so firm and strong as that of the other arm.

Being desirous of knowing how far the functions of the arm could be performed with the loss of the inferior articular extremity of the os humeri, I lately requested this patient, who is now fifteen years of age, to call upon me, that I might have an opportunity of examining the present state of his arm.

May 18th, 1802, he favoured me with a call, and permitted me to make such an examination as I thought proper.

The cicatrix extended from the tendon of the biceps to the olecranon, and was situated on the exterior side of the joint.

The tendon of the extensor triceps was attached, as usual, to the superior part of the ulna; but the olecranon might be moved in any direction, having now no support from the condyles of the os humeri. I could easily place my

fingers on the hooked extremity of the olecranon, which now lay on the inner side of the os humeri.

The inferior extremity of this bone extended downwards below the highest part of the ulna, and was attached to the middle of the cicatrix.

There was a round bag, about the size of a large nutmeg, containing some fluid substance, united with the extremity of the os humeri, and lying betwixt it and the olecranon. It seemed probable to me, that this might be a part of the capsular ligament, which I had left upon dissecting out the extremity of the os humeri, and which, having attached itself to the end of the bone, was now filled with synovia.

The head of the radius could not be felt. It seemed to be sunk deep amongst the muscles of the fore-arm, and was covered by the extremity of the os humeri.

The length of the mutilated bone was about an inch and half less than that in the sound arm.

The right fore-arm was moderately muscular and plump, but not so thick as the left. Above the elbow the right arm was much smaller than the left.

The young man could perform the motions of flexion and extension very readily with the right arm; but not those of pronation and supination with the fore-arm alone. He imitated this motion very well by giving a rotation to the whole arm.

He could place his hand upon his head, by giving the arm a swinging motion; but he could not lift a glass of wine to his mouth. His father informed me, that he could lift heavy weights, and do many other things with his arm in a depending position.

I was informed that he could write pretty well with the right hand; and I observed that he made use of his right hand so as to give considerable assistance to the left, in putting on his neckcloth, which I had removed for the purpose of measuring the length of his arms.

CHAPTER IX.

COMPOUND LUXATION OF THE ANCLE JOINT.

WHEN the fibula is broken near the joint of the ancle, the tibia almost always suffers a partial dislocation. If the integuments are not lacerated by the tibia, it is easily replaced, and with due care the fracture may be cured without injury to the joint. But when the force is very great, which produces this fracture, the extremity of the tibia sometimes bursts through the integuments, and thus forms a compound luxation of the joint. This is a very serious accident, and the best mode of treatment has not yet been ascertained by surgical writers. Probably there are few surgeons who have seen a sufficient number of these cases to enable them to form a decisive judgment on this subject.

The late Mr. Gooch, who was an able surgeon, says, "If the surgeon should judge it advisable to attempt saving a limb under such threatening circumstances, I am inclined to think he will be more likely to succeed by sawing off the head of the bone, especially if it has been long quite out, and exposed to the air."*

He then relates a case of this kind, in which Mr. Cooper of Bungay sawed off both the head of the tibia and fibula, by which means he preserved the limb, and made it so useful, that the patient was able to walk and work for his bread; of which success Mr. Gooch was a witness. Encouraged by this success, I pursued the same method of cure in the following case.

* Gooch's Cases in Surgery, p. 103, ed. 1st.

CASE I.

September 16th, 1766, Mr. W. Hebden, about fifty-six years of age, was attacked by a bull, which threw him down and caused a compound luxation of the tibia at the right ancle. The fibula was broken near the extremity of the tibia. The head of that bone, which lies below the tibia, remained attached to the astragalus. There was a considerable laceration of the integuments and capsular ligament on the inner side of the ancle; but on the outer side they remained whole. The tendo achillis, as well as the flexor and extensor tendons of the foot, appeared to be uninjured. About two inches of the extreme part of the tibia lay exposed, which I sawed off, together with the corresponding part of the fibula. The leg was afterwards placed upon its outside, in a relaxed position, and was covered with a poultice. An opiate was given.

2d day. He had rested well. Pulse ninety-five; full and hard. Nine ounces of blood were taken from his arm.

3d day. Pulse ninety-eight; not so full. Had rested tolerably without an opiate. A solution of cathartic salt was given.

4th day. Pulse seventy. Wound looked well.

6th day. Pulse seventy-six. Suppuration had taken place in a part of the leg, a little above the wound, which had been bruised by the bull. The matter had passed into the wound.

9th day. I made an opening on the outer side of the tendo achillis, to discharge the matter lodging in the wound, now become rather too offensive. Granulations shoot up well from the sides of the wound.

11th day. Pulse eighty. The matter was discharged in part through the depending orifice. Granulations had arisen from the cartilaginous covering of the astragalus.

15th day. Pulse seventy-six. A large slough of the capsular ligament lay in the wound. Quantity of pus

diminished. The bruised part above now discharged very little matter. Bandage is now used without poultice.

18th day. Pulse sixty-eight. The wounded part began to feel stiffer.

22d day. A glairy fluid began to appear in the wound. The slough was cast off about this time. The wound continued to lessen very fast, being filled with granulations. His appetite good. He had been allowed animal food as soon as the first inflammatory symptoms ceased.

From this time he recovered well, and I left him to the care of the surgeon who had been first called in.

I was in hopes that this patient would have been able to walk stoutly; but in this I was disappointed. He walked indeed without a crutch, but his gait was slow, his leg remaining weak, and his toes turning outwards, which rather surprized me, as his leg was very straight when I ceased attending him.

A light steel supporter, as recommended by Mr. Gooch, ought to have been used in this case when the patient began to walk abroad.

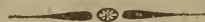
I have not recited this case with the view of recommending a similar practice in all cases of this accident, for I have not always adopted it; nor am I of opinion, that the same mode of treatment, whether by replacing the bones, sawing off their extremities, or amputating the limb, ought to be universally practised. When the laceration of the capsular ligament and integuments is no greater than is sufficient to permit the head of the tibia to pass through them, and when at the same time the joint or contiguous parts have suffered no other injury, I should recommend the replacing of the bone, and an union of the integuments by future, with the subsequent treatment above recommended in wounds of the joints.

CASE II.

In September 1798, I was desired to visit a young man at Walton, near Wakefield, who, by being thrown out of a whiskey the preceding evening, had suffered a compound dislocation of the tibia at the ancle. The surgeon who was attending him had replaced the bone not long after the accident, and had put splints upon the leg, with a pretty tight bandage. I found the limb somewhat swelled, with a tendency to inflammation. The orifice, through which the tibia had passed, was considerably closed. Under these circumstances I did not think it necessary or proper to make any future of the integuments; but after removing all compression, I placed the leg in a bent position on its outer side, and applied a mild poultice. The patient recovered extremely well; but about three months after his cure an ulcer took place in the integuments which had been lacerated, and finding that this did not heal readily, he came to Leeds to put himself under my care. After the ulcer was healed, which happened in the course of three weeks, I procured a steel supporter, as the ancle was rather weak, and the tibia had a tendency to project inwards. This enabled him to walk with ease.

If the laceration of the joint be very great, and the contusion considerable, I should judge it the most safe method to amputate the leg; but I am strongly inclined to think, that the loss of the limb is rarely necessary in a compound luxation of the tibia, which is not attended with any other injury, except a fracture of the fibula, and this must of course take place whenever such a luxation occurs, unless the astragalus is also dislocated. Mr. Gooch relates a case of this kind, but speaks of it as a singular accident. I have seen one, and but one instance of it. The reduction of the bones was impracticable, and amputation was judged to be absolutely necessary. The case which I saw, occurred in 1758, when I was a pupil of St. George's Hospital in London. The patient was a corpulent woman,

who in alighting from a horse on which she had been riding single, happened to catch hold of the stirrup with the heel of one shoe. In consequence of this she came down to the ground upon the other foot, with so much violence, that the inferior extremities of the tibia and fibula, together with the astragalus, were forced through the capsular ligament and integuments. Mr. Bromfeild, whose patient she was, finding reduction to be impracticable, immediately amputated the leg, but the woman did not recover.



CHAPTER X.



ON RETENTION OF URINE.

A RETENTION of urine in the bladder, when the natural efforts are incapable of affording relief, is, in male subjects, a disease of great urgency and danger. This retention may arise from a variety of causes, which operate as a mechanical impediment to the flow of urine; such as strictures in the urethra, calculous concretions fixed in any part of that canal, abscesses in the penis or perinæum, &c. each of which must require a specific mode of treatment. It is not my design, however, to enlarge upon these causes of retention; but to consider the disease in its most simple state, and to confine my observations chiefly to that mode of relief, which arises from the use of the catheter.

Persons advanced in years are more subject to this complaint than those who are young, or middle aged. It is often brought on by an incautious resistance to the

calls of nature; and, if not speedily relieved, generally excites some degree of fever. It is sometimes attended with a considerable degree of fever, and an inflammatory affection of the bladder, which terminates in a discharge of purulent matter, and a fatal hectic.

The distinction, which has sometimes been made, between a *suppression* and *retention* of urine is practical and judicious. The former most properly points out a defect in the secretion of the kidneys; the latter, an inability of expelling the urine when secreted.

The disease of which I am speaking, under the term *retention of urine*, is, an inability, whether total or partial, of expelling, by the natural efforts, the urine contained in the bladder. The characteristic symptom of this disease, previous to the introduction of the catheter; is a distension of the bladder (to be perceived by an examination of the hypogastrium), after the patient has discharged all the urine which he is capable of expelling.

As this complaint may subsist, when the flow of urine from the bladder is by no means totally suppressed, great caution is required to avoid mistakes on this subject.

Violent efforts to make water are often excited at intervals, and during these strainings small quantities of urine are expelled. Under these circumstances, the disorder may be mistaken for the strangury.

At other times, a morbid retention of urine subsists, when the patient can make water with a stream, and discharge a quantity equal to that which is commonly discharged by a person in health. Under this circumstance, I have known the pain in the hypogastrium, and distension of the bladder, continue, till the patient was relieved by the catheter.

And lastly, it sometimes happens, that when the bladder has suffered its utmost distension, the urine runs off by the urethra, as fast as it is brought into the bladder by the ureters. I have repeatedly known this circumstance cause a serious misapprehension of the true nature of the disease.

In every case of retention of urine which I have seen, the disease might be ascertained by an examination of the hypogastrium, taken in connexion with the other symptoms. The distended bladder forms there a hard and circumscribed tumour, giving pain to the patient when pressed with the hand. Some obscurity may arise upon the examination of a very corpulent person; but in all doubtful cases the catheter should be introduced.

I have seen but a few cases of the *ischuria renalis*, or complete suppression of the secretion of urine by the kidneys. The disease proved fatal in all my patients except one, in whom it was brought on by the effect of lead, taken into the body by working in a pottery. It subsisted three days, during a violent attack of the colica pictonum, and was then removed, together with the original disease. I found no difficulty in distinguishing this disorder, in any of the cases, from the *ischuria vesicalis*, though, for the satisfaction of some of my patients, I introduced the catheter.

Before I proceed to describe that method of introducing the catheter [which I have found most successful], I shall premise a few anatomical observations on the parts concerned in this operation; and shall point out the principal difficulties which occur in it, when the disease is in its most simple state.

In all operations on the parts contained within the pelvis, it is necessary to keep in mind the angle which the axis of the pelvis forms with that of the abdomen. When the body is upright, the ossa pubis approach considerably towards a horizontal position. Now, as the bladder is connected with the posterior surface of the ossa pubis, the depressed position of these bones gives a considerable curvature to the membranous part of the urethra, which passes round their inferior angle. This part of the urethra is about an inch in length. Its coats are thin. They are unprotected by the corpus cavernosum, and are immediately surrounded by a yielding cellular and adipose membrane. The prostrate gland, when divided horizontally,

somewhat resembles the figure of a heart stamped upon a pack of cards. Its point is turned towards the ossa pubis. The urethra enters the gland at its point, and passes through it, running upwards and a little backwards. The greater part of the prostrate gland lies behind the urethra. The neck of the bladder descends lower before than behind, and is much strengthened in its anterior part with muscular fibres.

In our attempts to introduce the catheter, we should have regard to the curvature of the urethra, its connexion with the contiguous parts, and the manner in which it passes through the prostrate gland. If the curve described by the point of the catheter, in an attempt to introduce that instrument, is less than the curve of the urethra, it is evident, that the point of the catheter will be pushed against the posterior part of the urethra, instead of following the course of that canal. The posterior part of the urethra has nothing contiguous to it, which can support it; and no considerable degree of force is necessary to push the point of the catheter through that part, between the bladder and the rectum. If this accident is avoided, still the point will be pushed against the inferior surface of the prostrate gland, and cannot, in this direction, enter the bladder.

The truth of this statement is farther manifest from the assistance which one receives, in the introduction of the catheter (whenever it stops at the prostrate gland), by elevating the point of the instrument with a finger introduced within the rectum. This gives a greater curvature to the course of the instrument, and facilitates its entrance into the prostrate gland. When I come to describe the use of the flexible catheter, I shall mention another method of giving the point of the instrument a direction considerably curved, while it passes through the membranous part of the urethra, and farther illustrate the advantage of this manœuvre. There is no great danger of pushing the point of the catheter through the anterior coats of the urethra, as they are supported by the ossa pubis, and as

the urethra enters and passes through the prostate gland in a direction nearly vertical.

The difficulty of performing this operation, arising from the causes above mentioned, shews the impropriety of pushing forwards the point of the catheter before its handle is sufficiently depressed. If the catheter is pushed on while its handle is in a vertical position, it is evident that the point must move in a horizontal direction. Any force used in this direction greatly endangers the wounding of the urethra. But if the catheter is pushed forwards when the handle is in a horizontal position, the point of the instrument will then ascend in a vertical direction, which is the most proper for its passing through the membranous part of the urethra, and prostate gland, without injury.

Another difficulty, which sometimes occurs in the introduction of the catheter, arises from the inflamed and dry state of the urethra. In this case the catheter does not move freely in the urethra, and the proper turns cannot be made with ease and exactness.

The previous introduction of a bougie, well covered with lard, greatly facilitates, in this case, the passage of the catheter. But great caution should be used if the bougie meets with resistance, as even this instrument is capable of penetrating the coats of the urethra, when its point does not take a proper direction.

CASE I.

I was called one morning to assist a young man, who had been in great pain all the preceding night from a retention of urine, and who had been drinking freely of gin, to enable him to make water. I immediately made use of an elastic gum catheter, covered with fresh lard, which entered the urethra without difficulty. It had scarcely passed half the length of the penis, when the resistance became so great from the adhesion of the urethra to the instrument,

that I thought proper to withdraw it. That part of the catheter, which had been in the urethra, appeared dry as if it had been wiped with a cloth. I then introduced a small bougie, well anointed, which dilated and moistened the urethra; and thereby enabled me to introduce the same catheter with ease.

Having premised these general observations, I shall proceed to point out the method of directing the catheter, which I have found most effectual.

I place my patient upon a bed, in a recumbent posture, his breech advancing to, or projecting a little beyond, the edge of the bed.* If the bed is so high, that his feet do not rest upon the floor, I support the right leg by a stool, or by the hands of an assistant. The patient's head and shoulders are elevated by pillows; but I leave the lower part of the abdomen in a position nearly, if not entirely, horizontal. I commonly introduce the catheter with its convex side towards the abdomen; and, having gently pushed down the point of the instrument, along the symphysis pubis, till its passage in that direction is stopped by the curvature of the urethra, I turn the handle of the catheter towards the navel, pressing at the same time its point against the symphysis pubis. Without this pressure, the point of the instrument is apt to recede, and in that case it does not readily enter the membranous part of the urethra. In making the turn I sometimes keep the handle at the same distance from the patient's abdomen, and sometimes make it gradually recede; but in either method I avoid pushing forwards the point of the catheter any further than is necessary to carry it just beyond the angle of the symphysis pubis. When I feel that the point is beyond that part, I pull the catheter gently towards me, hooking,

* I prefer a recumbent to an erect posture, because it is easier to the patient, and keeps him more steady during the operation. Besides, as this posture is often necessary on account of the patient's weakness, and is, to say the least, equally convenient; I give it the preference, that I may not suffer any embarrassment from being compelled to do it in a position to which I am not accustomed.

as it were, the point of the instrument upon the pubis. I then depress the handle, making it describe a portion of a circle, the centre of which is the angle of the pubis. When the handle of the catheter is brought into a horizontal position, with the concave side of the instrument upwards, I push forwards the point, keeping it as close as I can to the interior surface of the symphysis pubis; for when passing in this direction, it will not hitch upon the prostate gland, nor injure the membranous part of the urethra.*

These directions are equally applicable, whether the surgeon, in making the turn, moves the catheter slowly, without taking hold of the penis, as Mr. Ware advises;† or moves it somewhat rapidly, holding the penis in the left hand, as other authors have advised.

They are applicable also when the catheter is introduced with its concave side towards the abdomen,‡ except that instead of making the turn, the handle must from the beginning be kept near the abdomen, till the point has reached the angle of the symphysis pubis. The same method likewise, *mutatis mutandis*, may be followed, if the patient remain in an erect posture during the operation.

I have hitherto supposed the surgeon to make use of a silver catheter. If he uses a flexible one, covered with elastic gum, it is of great consequence to have the stilet made of some firm metallic substance, and of a proper thickness. I always make use of brass wire for this purpose. If the stilet is too slender, the catheter will not preserve the same curvature during the operation; and it will be difficult, if not impossible, to make the point of the instrument pass upwards behind the symphysis pubis in a

* In giving instructions to my pupils respecting this operation, I advise them to conduct the instrument as if the urethra was glued to the symphysis pubis on both sides (that is, both within and without the pelvis); observing that, although this is not anatomically true, the idea will lead them to act in a manner most conducive to a successful and safe introduction of the catheter.

†, *Memoirs of the Medical Society*, vol. 2. art. 30.

‡ *Bell's Surgery*, vol. 2. p. 34.

proper direction. If the stilet is too thick, it is withdrawn with difficulty.

When the stilet is of a proper thickness, this instrument has one advantage over the silver catheter, which is, that its curvature may be increased while it is in the urethra. This alteration in the shape of the instrument is often of great use when the point approaches the prostate gland. The advantage to be obtained by it first occurred to me on the following occasion.

CASE II.

I was introducing the elastic gum catheter in a patient whose prostate gland was much enlarged, and upon whom the operation was, on this account, rendered difficult. Finding some obstruction near the neck of the bladder, I determined to withdraw the stilet that I might see whether the urine would run off through the catheter. When I began to draw out the stilet, holding the catheter with my left hand, I rather repressed the instrument, and was agreeably surprized to find, that as I drew out the stilet the catheter passed into the bladder.

This accidental success put me upon considering the effect produced by withdrawing the stilet, and I immediately perceived, that as soon as the stilet is moved the curvature of the catheter is increased. In the operation, therefore, by this motion of the stilet, the point of the catheter must be lifted up, and will thereby be prevented from striking against the inferior surface of the prostate gland, and will be directed into the neck of the bladder. This discovery has been of great use to me in many difficult cases. It will be understood by any one who observes the motion which a flexible catheter makes upon withdrawing the stilet.* The effect, however, is lost, if the

* The effect of withdrawing the stilet in part will be fully understood by a view of the second figure in plate vii. The dotted lines represent the curvature which the catheter takes in the act of withdrawing it.

stilett be too slender; for in that case it is rendered straight by the act of withdrawing it, and consequently it cannot increase the curvature of the catheter.

There is another method of introducing the elastic gum catheter, which sometimes answers very well, though it will not always succeed. It is this: Take a catheter which has acquired a considerable degree of curvature and firmness, from having lain by for a long time with a curved stilett in it.* Introduce this, without the stilett, with its concave side towards the abdomen; observing the caution above given, to avoid pushing on the point of the instrument, when it has arrived at the symphysis of the pubis, until its handle is depressed into a horizontal position. If the urethra has not been injured, and is in a moist state, this method often succeeds; but chiefly after an elastic catheter has been kept for some days in the urethra. Cases occur, where a frequent extraction of the urine is necessary, and where the surgeon is at such a distance from his patient as to be unable to give a frequent attendance. Under these circumstances, if the patient cannot be removed, we are under the necessity of leaving a catheter in the urethra, until the method last described can be performed with ease. It may then be committed to the care of a dextrous and intelligent servant, or even of the patient himself.

Whatever method of performing this operation is pursued, the catheter should be introduced with the greatest gentleness. When any obstruction occurs, the design of the surgeon should be to *evade* rather than *overcome* it. Unsuccessful attempts may render a case extremely difficult, which was not so before. I wish to impress upon the mind of my reader, that a moderate force, improperly directed, is capable of injuring the urethra in such a manner, as to render the operation almost (and without a just knowledge

* A catheter, which has acquired the exact form of the urethra, would be preferable; but such an one cannot always be procured.

The exact form of an old flexible catheter, which had lain a considerable time in the urethra, and which had so much rigidity as to retain its form after it was withdrawn, is given in plate vii. fig. 1.

of the injury, altogether) impracticable. It must be obvious to every surgeon, that long continued or violent attempts, have a tendency to increase the inflammation of the urethra. But the accidents to which I mean particularly to direct the attention are, the formation of a kind of pouch in the urethra, and the laceration of its membranous part. I shall relate an instance of each of these, and describe the methods used to surmount the difficulty which they afforded to the introduction of the catheter.

CASE III.

I was consulted for a gentleman advanced in years, who laboured under a retention of urine, attended with much fever, and pain in the hypogastrium. His surgeon had repeatedly drawn off the urine; but could not any longer introduce the catheter, on account of an obstruction in the most depending part of the urethra, in its passage through the perinæum. Before I made any attempt to introduce the catheter, I gave the patient, with the concurrence of the physician and surgeon who were attending, fifty drops of tinct. opii. and put him into a warm semicupium. As he was now much reduced, and of a gouty habit, bleeding was not used. As soon as he was taken out of the warm bath, I placed him in the position above described, and attempted to introduce the catheter with its convex side towards the abdomen. When the point of the instrument arrived at the lowest part of the urethra, I made the turn as usual, but could not elevate the point behind the symphysis pubis. The urethra seemed to be completely obstructed, as if it had terminated at the part I have mentioned. I had no reason to think that the urethra was lacerated, as the obstructed part felt smooth; but I apprehended that a kind of pouch was formed there, (by the dilatation of some crypta of the urethra, or in some other way) which acted as a valve in the canal. As in all the attempts to introduce the catheter its convex side had been directed towards the abdomen, I thought there was reason

to conclude, that this valve was formed in the inferior side of the urethra. I judged, therefore, that the most probable method of evading the difficulty would be to keep the point of the catheter, from its first introduction, as close to the superior side of the urethra as possible. I had before varied the direction of the instrument without success, and was now convinced, that I could not keep its point in a close contact with the superior side of the canal, unless the concave side of the catheter was turned towards the abdomen. An attempt made in this manner prevented the point of the instrument from entering the pouch formed in the urethra, and enabled me to reach the bladder. The catheter, which was a flexible one, was retained in the urethra; and by the assistance of gentle laxatives, with cooling and demulcent medicines, and a proper diet, our patient recovered.

The greatest impediment to the introduction of the catheter (in cases of simple retention of urine) arises from the laceration of the membranous part of the urethra, when the point of the instrument has passed through it, between the bladder and the rectum. I am not aware that I have ever met with a case, in which the urethra was perforated between the bladder and the ossa pubis; nor do I think such an accident is likely to happen. Many authors have given cautions against injuring the membranous part of the urethra; but I do not recollect any one, except Mr. Bromfield, who has spoken of this injury as a case which he had often met with. Mr. B. says,* “I have seen *several instances*, where, from a slit having been made through that part of the urethra by the instrument, and in order to prevent future suppressions, bougies have been used; the consequence was, that the bougies finding a readier passage through the slit, than into the neck of the bladder, a false route was obtained. Three instances of which I lately saw.” He then relates the case of a patient, who had been repeatedly searched for the stone by himself, and another eminent surgeon, neither

* Chirurgical Obs. vol. 2. p. 302.

of whom could ever make the sound pass into the bladder, on account of a perforation in the membranous part of the urethra, betwixt the bladder and the rectum.

I am now fully persuaded, that this accident occurs more frequently than is commonly imagined; that it may happen in the hands of a surgeon accustomed to introduce the catheter, and when no great force has been used; and that it always renders the operation difficult, and sometimes impracticable to those who are not aware of the nature of the difficulty which they have to encounter.

And here I must confess, that it was an error in my own conduct which first led me to consider this subject with peculiar attention, and which has since enabled me to preserve the life of some of my fellow creatures.

A little boy was brought to me about thirty years ago, who had symptoms of a stone in the bladder. I had not at hand a sound small enough to enter his urethra, except one which had its point somewhat conical. I had then been much accustomed to introduce the sound and catheter, and was not conscious of using any improper force at this time. However, when the instrument had passed to a sufficient extent, I found reason to suspect that it was not in the bladder. Upon introducing my finger into the rectum, I was surprized to feel the sound so distinctly through the coats of the intestine, as to leave no doubt that I had perforated the membranous part of the urethra betwixt the prostate gland and the rectum. I immediately withdrew the sound, and dismissed the boy for that time, who suffered no other inconvenience from this accident than a little smarting for a few days upon making water.

This injury, arises chiefly, I apprehend, from the method (which, as far as I have seen, is not an uncommon one) of pushing forwards the catheter before its handle has been depressed. By this method, the course of the instrument crosses that of the urethra; and the point of the catheter, pressing against the posterior side of the membranous part of the urethra, is easily forced through the coats of that

canal. The want of due curvature in the catheter, and of sufficient bluntness in its point, greatly contribute to facilitate this injury.

When the membranous part of the urethra has been pierced, the point of the instrument passes more readily into the wound, than into the bladder. For the wound being made near the prostate gland, where an elevation of the point of the instrument is required; it becomes very difficult to avoid the aperture, and pursue the natural course of the canal. The following case will point out the method which I have used to ensure success in the operation, when rendered difficult by this accident.

CASE IV.

In January 1787, I was desired to visit an old gentleman forty-five miles from Leeds, who was labouring under a retention of urine, and could not any longer be relieved by the surgeon who attended him. I arrived at three in the morning, and found the physician and surgeon waiting my arrival. The latter gave me the following history of the case: That Mr. M. having been seized with a retention of urine betwixt three and four weeks before, he (the surgeon) had extracted the urine without difficulty, and had repeated the operation twice, and sometimes thrice in the day, during three weeks. He then began to find some obstruction in the urethra near the prostate gland, which increased at every operation, till he was unable any longer to introduce the catheter. The patient had now been three days without relief, and the bladder was largely distended. Upon introducing the catheter, its point, when it had approached the prostate gland, passed into a substance that felt ragged and fibrous. I had no doubt, from this sensation, that the posterior side of the urethra was perforated. The object now was to keep the point of my catheter close to the anterior side of the urethra, as it passed through its membranous part, that I might avoid the wound, which the point of the instrument entered with readiness. The

stilet of my flexible catheter, which I first used, was rather too weak; I therefore bent a silver catheter, at the distance of about an inch from its point; that, having a greater curvature than usual in that part, I might be enabled to keep the point of the instrument more closely in contact with the anterior part of the urethra, and thereby pass over the wound made in the posterior side of that canal. This method, assisted by the mode of introduction already described, was attended with success, and I drew off about four pints of urine.

As I could neither stay with my patient, nor leave him with propriety in this situation, I thought it necessary to introduce an elastic gum catheter, which might remain in the urethra till the wound should be healed. I procured some brass wire of a proper thickness, with which I made a stilet; and having given it the same curvature as that of the silver catheter with which I had extracted the urine, I introduced it about four hours after the former operation, and fixed it by tying it to a bag truss put upon the patient.

It is remarkable, that I drew off a quantity of urine from the bladder, that had been emptied but four hours before, nearly equal to that which was found in the bladder after the retention had subsisted three days.

The life of my patient was preserved at this time; but the catheter was suffered to remain in the bladder. After some weeks an inflammatory affection ensued, which brought on a discharge of purulent matter, and the patient died hectic about six months after my visit.*

* The following accounts, which I received from Mr. M's surgeon, shew the progress of the complaint after my visit.

“ Feb. 19th, 1787.

“ Our patient, Mr. M. seemed to enjoy a good state of health from Jan. 4th, to Feb. 4th, when he had a discharge from the urethra similar to that of a gleet, attended with a little inflammation of the glans penis. He has also for this week past found a little uneasiness when he wanted to have his water drawn off.” (I suppose by taking the cork out of the flexible catheter, which I had left in the urethra).

I could relate other cases of a similar nature which have occurred to me; but as I have succeeded with the assistance of an elastic gum catheter, either by withdrawing the stilet in part at the moment when I wished to increase the curvature of the catheter, or by giving the instrument a considerable degree of curvature previously to its introduction, I shall not trouble my reader with a more particular relation.

In one case, where the urethra had been injured near the symphysis pubis, by a violent contusion, (my patient's horse having fallen backwards upon him, and struck the parts with the pommel of the saddle) I drew off the urine with a silver catheter of unusual thickness, after I had failed with instruments of a smaller bore. In this case I suspected a rupture of the urethra, and was obliged to elevate the point of the catheter with my finger in the rectum, before it would pass the injured part. I was also obliged to use repeated bleeding, purgatives, the warm bath, and large doses of opium, before I could succeed in the introduction. After the first introduction I used the elastic gum catheter, in the manner above directed.

The invention of the flexible catheter, covered with elastic gum, has been of great utility in this important operation of surgery; but it is a question not yet decided, whether the cure is more promoted by leaving the catheter in the urethra until the patient regain the power of expelling his urine, or by extracting the urine twice a day, and withdrawing the catheter after each operation.


“ July 1st, 1787.

“ Mr. M's complaint still continues.—The irritation is so great as
 “ to require the water to be drawn off every two hours. For some
 “ time past there has been a quantity of mucus and pus rather fetid
 “ discharged with the water, which has been so corrosive as to destroy
 “ the instrument you lent, and also one that was introduced the 27th ult.
 “ For the last fortnight the discharge has been less offensive, but mixed
 “ with blood, which alarms him much.

“ The flexible catheter is constantly withdrawn, when Mr. M. jun.
 “ is at home, except in the night, when his father dare not sleep
 “ without it. He” (the son I suppose) “ can introduce the flexible
 “ one very well, but cannot the common one.”

As far as it concerns the removal of the inflammatory symptoms, I do not see that any general rule can be laid down. I have seen some patients who could not bear the catheter to remain in the urethra without great uneasiness; while others have recovered from the first inflammatory stage of the disease, even in bad cases, without appearing to be hurt by wearing the catheter constantly. Yet, upon the whole, I prefer the removal of the catheter after each operation, in all ordinary cases; and now always use this method, when my patient is near, and under my own immediate care.

With regard to the respective merits of these methods, as promoting the complete cure of the disease, my opinion seems at present to be decided. I have tried these different methods so often, and in cases so nearly similar, that I can scarcely entertain a doubt, that a person regains the power of expelling his urine much sooner when the catheter is withdrawn after each operation, than when it is left in the urethra.

The best method of retaining the catheter in the urethra, which I have tried, is the following. To each side of a bag truss, made with a strap to go over the penis, I sew on three small loops of tape. The lower loops are fixed to the middle of the truss; the two higher to the extremities of that part which goes over the penis. When the truss is put on, and a piece of very narrow flat tape is put through the rings of the catheter, I put the opposite ends of the tape first through the lower loops on each side, and then through the middle loops; and after carrying the ends of the tape across each other beneath the penis, and making them pass through the highest loop on each side, I tie them above the penis upon the middle of the pubes. By this method the catheter is kept steady, if the patient is moderately cautious. To prevent the extremity of the catheter from catching hold of the patient's clothes I sometimes apply a  bandage over the bag truss and catheter, or fasten the middle strap of such a bandage over the suspensory, by which method the catheter may be kept quite secure.

I have already mentioned some circumstances, which have a tendency to mislead the medical practitioner, in the treatment of the disease which I am now considering; and it may be of use to add a few observations on these sources of deception.

CASE V.

In the early part of my practice, about forty years ago, I was attending Mr. Hepworth, an elderly man, who laboured under a retention of urine. I had drawn off his water morning and evening for a few days, when I was informed, that he had regained the power of relieving himself. About a pint of urine was shewn to me, as the quantity which he had made in the course of the night with a natural stream. I began to apprehend that my attendance would be no longer necessary; but as he still complained of the same uneasiness in the hypogastrium, I examined the state of the abdomen, and was surprised to find the bladder distended as much as it had usually been before his urine was extracted, and the operation was found to be as necessary as it had been before.

This case taught me the necessity of continuing to introduce the catheter, till it clearly appears, that the patient can empty his bladder by the natural efforts.

CASE VI.

About two years ago I was desired to visit a patient early in the morning, whom I had repeatedly attended on account of a retention of urine. He complained of considerable pain in the hypogastrium, though he had made two quarts of urine in the course of the night. I found his bladder distended, and drew off about a pint of urine, which he had not been able to expel.

When there has been a necessity for extracting the urine by the catheter during two or three weeks, the power of

expelling it voluntarily generally returns by degrees. The propriety of omitting the operation is not to be determined by the quantity of urine which the patient expels, but by the power of emptying the bladder.

Another source of deception is the involuntary discharge of urine, which sometimes succeeds a retention that is not relieved by the catheter. This is not so frequent an occurrence as the former; but it is highly dangerous, when the proper means of relief are neglected.

CASE VII.

I was desired to visit Mr. Lawn, of Hunstret, near Leeds, an old man, who had laboured under an incontinence of urine about fourteen days. Upon inquiring into the manner in which this disease commenced, I found that it had been preceded by an inability of expelling his urine. This circumstance led me to examine the abdomen, when I found the bladder distended greatly, and giving pain when pressed upon. I extracted the urine by means of the catheter; but notwithstanding the temporary relief which this operation afforded him, he died the following day, though the complaint in his bladder seemed to be the only disease which had affected him.

CASE VIII.

May 17th, 1798, I visited Mr. B. aged sixty-seven years, who lived about sixteen miles from Leeds, and laboured under an incontinence of urine.

About a fortnight before I saw him, he had been seized with an inability of discharging his urine freely, attended with considerable pain in the hypogastrium. In the course of two or three days he lost entirely the power of expelling his urine by any voluntary efforts, and it began to flow from him involuntarily, and incessantly.

I found him in a very weak state. His tongue was white, and rather dry. His pulse frequent. His thirst

considerable. He was restless, being able to get very little sleep, and having a constant uneasiness in the abdomen. The hypogastrium was enlarged, and felt very sore when pressed upon. The bladder was in a distended state, and rose somewhat higher than the navel. The penis was sore from the constant flow of urine.

I had suspected the nature of his complaint, from an imperfect account which I had received from a friend of the patient, who came to desire my attendance; and in consequence of this suspicion, I had brought with me a flexible catheter, and a bag-truss.

I immediately extracted his urine, though with some difficulty, and left the catheter in the urethra, secured by means of the bag-truss, in the manner above described.

He begged that he might have something to drink which was cooling, as his surgeon had confined him chiefly to gin and water for beverage, to enable him to expel his urine more freely. I gave him a basin full of milk, which he drank with the greatest pleasure. I wished to have brought him to Leeds with me, but he thought himself unable to bear the journey, and was desirous to remain at home. I advised him to let off the urine every four or five hours.

27th, I visited Mr. B. again, drew out the catheter, and after cleaning it, and removing the calculous matter which adhered to its extremity, I replaced it. He could not yet expel his urine.

A week after this visit Mr. B. was brought to Leeds. I waited a few days after his arrival before I withdrew the catheter; but did not observe any natural efforts which could enable him to expel his urine. On the 11th day after the last introduction I took out the catheter, the extremity of which, for the space of an inch, was curiously incruusted with calculous matter.

I now extracted his urine twice a day, withdrawing the catheter after each operation. I attended him at seven in the morning, and at nine in the evening, as there was al-

ways a more copious secretion of urine in the night-time than in the day. White matter, of a purulent appearance, flowed from the bladder with the last portion of urine.

As his nights were not passed comfortably, and as the painful desire to make water returned sometimes very early in the morning, I gave him for several nights a bolus at bed time with calomel gr. v. and opium gr. j. which procured comfortable rest, and seemed to hasten on the power of expelling his urine.

At the expiration of a week, after I had begun to introduce the catheter twice a day, he found a little involuntary discharge of urine in the morning as he lay in bed, and could then expel a small quantity by the natural efforts. At this time he rose to make use of the chamber-pot, but no sooner did he increase his efforts, than the flow of urine ceased. I advised him to lay some pieces of blanket so as to receive his urine when it began to flow involuntarily, and to use the most gentle efforts as he lay upon his side, when the involuntary discharge ceased. By this method the urine flowed in greater quantity, than by straining over the chamber-pot.

The purulent appearance of the last portion of urine ceased gradually, after I had begun to extract his urine twice a day; and at the expiration of sixteen days he needed no longer the assistance of the catheter.

CASE IX.

One evening I received a message from a young gentleman, desiring my attendance upon his father the next day. The message was accompanied with the following letter: "My poor father has been exceeding ill for the last fortnight. He was seized about that time with considerable pain, which Dr. — and Mr. — who attend him, think proceeded from some disorder in the urinary vessels. It was attended at first with a suppression of urine,

“ but has since changed to an involuntary discharge, which
“ occasions great pain and irritation.”

I went over to —— the next day, and took a catheter along with me, apprehending that the disease might prove to be a retention of urine. As soon as I was seated by the side of my patient's bed, I examined the hypogastrium, and found the bladder forming a hard tumour, which extended rather higher than the navel.

I desired that the surgeon might be sent for immediately, and comforted my patient with the prospect of speedy relief.

The disease had now subsisted sixteen days, and had begun in the following manner. Mr. —— was awaked about two o'clock in the morning, with a painful motion to make water, a complaint to which he was somewhat liable; but at this time he could discharge no urine. He remained in this distressing state for some hours; but in the course of the day (he could not recollect at what hour) the urine began to flow involuntarily. This evacuation, however, afforded him but a small degree of relief. He continued to have a constant uneasiness, attended with great restlessness; so that from the commencement of the attack his repose seldom continued above an hour at one time. He was feverish. Various remedies had been administered; and before my arrival, the fever had abated in some degree, and the pain was somewhat diminished. His tongue had become clean.

As soon as the surgeon arrived, the catheter was introduced, and four pints of urine were extracted. This was not high coloured, as is generally the case in a complete retention. I attributed its paleness to the constant influx of urine from the kidneys, and the constant flow from the urethra.

I never knew a patient appear to receive so little relief by the extraction of so large a quantity of urine. He was very weak, and continued to be restless and uneasy.

As this operation did not enable Mr. —— to expel his urine by the natural efforts, it was extracted again the fol-

lowing morning, and then exceeded somewhat four pints in quantity. In the evening of the same day, the urine drawn off was about a pint and half.

On the third day an elastic gum catheter was left in the urethra, and secured by means of a bag-truss.

Four days after I had left my patient, I received a message to inform me, that the catheter had slipped out of the urethra. The messenger brought me the following account from the physician who was attending.

“Some days ago the urine was very fetid, and alkaliescent, and at the bottom there was a considerable quantity of sanious mucus, which last has continued to appear, but the urine diminishes in quantity. Last night not more than from three to five ounces was discharged at a time, and that much loaded with bloody mucus. He has also complained of smarting and burning latterly when it was drawn off. The pulse has stood at ninety day after day.”

I set off immediately to visit Mr. —, but before my arrival the surgeon had replaced the catheter. The urine which was let off after this replacement was not more tinged with blood than it had been the preceding day; but at five in the afternoon, more than half the quantity of fluid which ran through the catheter was pure blood, and coagulated as it flowed. The quantity of blood which flowed at this time was about four ounces. The blood was florid, as if recently extravasated. Upon inquiry, I found that the belt of the bag-truss had been suffered to slide down below the hips, and had consequently drawn out the catheter.

I put on a fresh suspensory; added shoulder straps to it, and also a broad piece of single calico, which was put on as a bandage over all, for the purpose of covering the extremity of the catheter. This additional part was fastened to the belt behind with small buttons, and was pinned before; so that it might be readily removed when Mr. — had occasion to use the night-chair.

Our patient was evidently sunk with the hæmorrhage. A cold sweat lay upon his arm the remainder of the day, and his pulse was more feeble than usual.

We had directed Mr. ——— to abstain from wine, or to take very little, on account of the tender state of the bladder; but the degree of debility which succeeded the hæmorrhage induced us to change the plan of diet. We now directed him to drink half a pint of wine in the course of the day, partly old hock, and partly red port. We ordered the following medicines for him:

℞. Decoct. Cort. Per. ʒ vij.

Tinct. ----- simp. ʒj. misce sumat cochl. iij sextis horis.

℞. Aq. puræ ʒx. spt. cinnamomi.

Syr. simp. aa ʒj. tinct. ferri muriat. g^{tt}s xx. misce fiat haustus sextis horis sumendus.

These medicines were to be taken alternately every three hours.

The next day Mr. ——— seemed much recruited by the change of diet, and the medicines. His cold sweats were gone off, and his pulse in the afternoon, when I left him, was at eighty-eight. He was able to walk a little about his room. His urine was highly tinged with blood of a dark colour, but no fresh blood appeared.

Dr. ——— informed me by letter, that on the third day after this visit, a separation in the urine appeared, the dark-coloured sediment falling to the bottom. After that day there was no sediment, but the urine continued clear, and without fetor.

At the expiration of a fortnight I paid a third visit to Mr. ———. His urine had still continued clear, but was rather high coloured. Pulse seventy-eight. Tongue clean and moist. Appetite good. Strength increased.

The catheter was removed, that a trial might be made, whether our patient had regained the power of expelling

his urine. The inability still remained, and the catheter was replaced.

At the expiration of a week after my last visit, Mr. — came to Leeds. The retention of urine had now subsisted forty-seven days, during thirty-one of which the catheter had remained in the urethra, except when withdrawn for the purpose of trying our patient's ability of relieving himself.

Mr. — was not now so free from inflammatory symptoms as when the catheter was last withdrawn. His urine had a higher colour, and an offensive smell. Some flakes of purulent mucus were discharged along with it; and he felt pain in his bladder when the last portion of urine was flowing through the catheter. I was apprehensive that his diet had been too generous, with the view of increasing his strength.

I tried the effect of extracting his urine every twelve hours, without leaving the instrument in the urethra. But the secretion of urine was usually so copious in the night-time, that he was in a very painful state for some hours before the appointed time arrived for extracting his urine in the morning, notwithstanding he usually took two grains of opium at bed-time. I determined, therefore, to leave the catheter again in the urethra, and try by a strict regimen, and other appropriate means, to remove the inflammatory symptoms which still remained. Mr. — left off the use of flesh meat and wine, took gentle laxatives occasionally, and drank the *lac amygdalæ*, with mucilage of gum arabic added.

I removed the catheter after it had remained about a fortnight in the urethra; and as my patient could not yet relieve himself, I thought it best to extract his urine every eight hours, (*viz.* at ten in the evening, at six in the morning, and at two at noon), to prevent too great an accumulation in the bladder. This method was attended with such success, that at the expiration of a week he began to expel a considerable part of his urine by the natural efforts. I continued to introduce the catheter once or twice a day, for

a few days, and then once in two or three days, till I found him capable of emptying the bladder. He had received so much benefit from the opiate, that he continued to take a single grain every night at bed-time.

After remaining two or three weeks longer at Leeds, to try the effect of exercise, and his usual mode of living, he returned home perfectly free from the disorder, which had afflicted him nearly three months, and which had repeatedly been attended with very dangerous symptoms.

REMARKS.

I have related this case at some length, as it affords much instruction in the management of this important disease.

1. We see how soon a complete retention of urine may change to an involuntary discharge, the bladder still remaining in a distended state. I questioned Mr. — very strictly respecting the time at which the involuntary emission of urine took place; but he could not recollect the hour exactly. The information which I received from those who attended him led me to conclude, that the total suppression had not continued above twelve hours before the involuntary discharge commenced. This speedy alteration in the appearance of the disease, caused the antecedent suppression to be overlooked; and led to an omission of the appropriate remedy.

2. I have frequently observed, as occurred in this case, that a copious secretion of urine immediately succeeds the first extraction, when the retention has not been speedily relieved. The quantity of urine extracted after twelve hours exceeded that which had been drawn off at the first operation by about half a pint. In Mr. M's case (Case IV.) the quantity of urine extracted after the short interval of four hours, was nearly equal to that which had been previously extracted after a complete retention had subsisted for three days.

3. In extracting the urine regularly night and morning, with the exact interval of twelve hours, I have often ob-

served, that the quantity of urine secreted in the night, has exceeded that secreted in the day. This occurred in an unusual degree in the present case. The quantity of urine drawn off in the evening seldom amounted to a pint, and sometimes did not exceed half a pint; while the secretion in the night-time was often more than two quarts. Nay, it happened sometimes, that Mr. — discharged three or four pints in the violent strainings, which accompanied this abundant nocturnal secretion, while a painful retention continued, so that I drew off an additional pint in the morning.

4. This case shews, as clearly as a single one can shew, that a patient sooner regains the power of emptying his bladder by the natural efforts, when the catheter is withdrawn after each extraction, than when it is suffered to remain constantly in the urethra.

To the above remarks I have the pleasure to add, that the gentleman whose case is last related, has been more free from the attacks of painful micturition since his recovery, than he had been for a considerable time before.

I cannot conclude these observations, without urging the propriety of an early introduction of the catheter in this disease. Delay is not only fruitless, in general; but also renders the operation more dangerous, as well as more difficult, and usually protracts the completion of the cure. Besides, the great degree of inflammation which the bladder suffers, when the extraction of the urine is long delayed, brings on sometimes a suppuration in the part. I have seen many instances of this. The retention has indeed been cured, but a discharge of purulent matter has succeeded, and the patient has died tabid. If the circumstances of the case require bleeding, purging, the injection of a clyster, or the use of a warm bath; a delay for these purposes may be beneficial: but delay should only be considered as preparatory to a more safe introduction of the catheter.

PLATE VII.

Fig. 1, represents the exact form of an old flexible catheter, which had lain a considerable time in the urethra of a male patient. I have observed the same form in other catheters, which had been suffered to remain in the urethra, and which had firmness enough to retain that degree of curvature which they had acquired in the urethra.

Fig. 2, shews the effect which is produced in a catheter by withdrawing the stilet, if it is sufficiently firm. The figure in outlines, which is nearest to that of the inferior catheter, was taken when the stilet had been withdrawn about half an inch.



CHAPTER XI.

ON THE CURE OF THE PROCIDENTIA ANI
IN ADULTS.

CASE I.

IN autumn 1788, Mr. W. of Hull, consulted me on account of a complete and most troublesome *procidentia ani*, which came on whenever he had a stool, and continued for some hours; the gut gradually retiring, and at last

Fig. 1.

Fig. 2.



disappearing, until he had occasion to go again to the vault. The returns of this disease were invariable, and so distressing, when they happened in the day-time, that he had brought himself into the habit of having a stool every other evening, a little before bed-time. After each stool he used to place himself in a chair, and make a gentle pressure upon the prolapsed part, which afforded him a little relief: he then lay down in bed; and, the intestine by degrees regaining its natural situation, he found himself in the morning free from the prolapsus. While the intestine remained prolapsed, there was a copious discharge, from the part, of a serous and mucus fluid mixed with blood.

Although he had no pain, nor other inconvenience, during the intervals of these attacks, yet the *anus* did not return to its natural state. It was constantly surrounded by a thin pendulous flap, which was formed by the integuments, and hung down to the extent of three-fourths of an inch in general. The *anus* was also surrounded with several soft tubercles of a bluish colour, which were situated at the basis and interior part of the pendulous flap. These tubercles had the same appearance as those which often remain in persons who have been frequently afflicted with the external piles; and were evidently formed by the extremity of the *rectum*.

M. W. gave me the history of his disorder; which he afterwards wrote down, as follows:

“ When I was seven or eight years old, I remember to
“ have suffered much pain by the bowel coming down
“ after a stool; but I think this complaint did not continue
“ long with me. From that age till about twenty-two,
“ I enjoyed an excellent state of health, and had no appearance of any complaint in the *anus*; only I remember,
“ that I used often to feel an inclination to sit pretty long
“ at the vault, which I indulged probably too much.

“ About the age of twenty-two, on going to the vault,
“ I for the first time, perceived that I had voided a good
“ deal of clear blood; but do not remember that I had

“ any pain at that time. After this I was often, if not
“ generally, troubled with a little discharge from the
“ *anus*, which was usually of blood. I commonly per-
“ ceived some heat and uneasiness after a stool, and these
“ gradually increased, together with a small protuberance
“ on the edge of the *anus*; which last I think I did not
“ perceive till some weeks, perhaps months, after the first
“ discharge of blood. The discharge after stool increased
“ by degrees, so that in twelve or eighteen months after
“ the first attack I was obliged to apply linen cloths to the
“ part affected.

“ I was now constrained to mention my disorder, and
“ various applications were made use of for my relief, as
“ the powder of nut galls mixed with hog’s lard, elder
“ ointment, and a solution of Roman vitriol, but without
“ effect. Opening electuaries, sulphur, &c. were pre-
“ scribed for me, but to as little purpose, the disorder still
“ increasing. After about two years, I seldom parted
“ with a stool in less time than twenty or thirty minutes;
“ and often voided a good deal of blood. Thus I con-
“ tinued for several years, the pain after each stool, and
“ the protuberances gradually increasing, as did also the
“ discharge of blood and mucus.

“ After enduring this complaint seven or eight years,
“ I applied to Mr. Sharp, an eminent surgeon in London,
“ who gave me an ointment to apply after each stool,
“ some soapy pills to take, and recommended the use of
“ a clyster a little before going to stool; but this last I
“ could never effect, though it was that from which he
“ seemed to expect the most benefit.

“ For many years past I have seldom had a stool oftener
“ than every other day, and *always* with great pain after
“ it. For two or three years past the pain has seldom
“ subsided in less time than from four to six hours. In
“ the intervals I have been able to walk or ride on horse-
“ back with ease: and I have in other respects enjoyed a
“ good state of health, excepting sometimes a depression
“ of spirits, and more nervous feelings than formerly.

" My legs have occasionally small scarlet spots upon them,
 " and are sometimes swelled about the ancles.

" I think it is now about fifteen years since the first
 " attack of bleeding. I cannot say how long the gut has
 " been in the habit of coming down; but I think it did
 " not come down much, if at all, when I consulted Mr.
 " Sharp seven years ago; though the pain was then quite
 " similar to what it has been since, only it did not con-
 " tinue so long."

I recommended a trial of the following lotion, for wash-
 ing the part affected during the state of prolapsus; and
 I also advised him to keep it applied to the *anus* in the
 intervals, by means of a thick compress supported by
 the T bandage.

℞ Aq. Calcis simp. ℥ ij.

Cort. Quercûs contus. ℥ iv.

f. Infusum per hebdomadam, et colaturæ adde

Spt. Vini rect. ℥ iv. f. lotio.

He thought himself for a time somewhat relieved by
 the application: but farther trial shewed, that the relief
 obtained was inconsiderable; and that the disease was too
 obstinate to be cured by such treatment.

To obviate the bad effects which arose from the long
 continuance of the *prolapsus* after each stool, I tried to
 reduce the intestine soon after it came down; but the
 attempt gave him much pain, and afforded no relief. I
 was satisfied upon the trial, that the reduction was im-
 practicable.

Although the prolapsed part of the intestine consisted of
 the whole inferior extremity of the rectum, and was of
 considerable bulk; yet the impediment to reduction did
 not arise from the stricture of the *sphincter ani*; for I could
 introduce my finger with ease during the *procidentia*:
 but it seemed to arise from the relaxed state of the lowest
 part of the intestine, and of the cellular membrane which
 connects it with the circumjacent parts.

My attempt proved vain as to its immediate object, yet it suggested an idea which led to a perfect cure of this obstinate disorder.

The relaxed state of the part which came down at every evacuation, and the want of sufficient stricture in the *sphincter ani*, satisfied me, that it was impossible to afford any effectual relief to my patient, unless I could bring about a more firm adhesion to the surrounding cellular membrane, and increase the proper action of the sphincter. Nothing seemed to me so likely to effect these purposes, as the removal of the pendulous flap, and the other protuberances, which surrounded the anus. I hoped that the inflammation caused by this operation would produce a more firm adhesion of the rectum to the surrounding cellular substance; and I could not doubt that the circular wound would bring on a greater stricture in the *sphincter ani*. I explained my ideas to my patient, and he thought it right to submit to the operation which I proposed.

November 13th. After having given a gentle laxative, I removed with the knife all the pendulous flap above described, and the most prominent of those bluish soft tubercles which immediately surrounded the anus. Very little blood was lost by the incisions.

15th. Mr. W. continued easy; but an effort to go to stool, which he made this day, caused a small part of the rectum to appear within the *sphincter ani*. I hoped that this prolapsed part would have gradually retired as it used to do; but, instead of this event, the rectum came down in greater quantity, attended with much pain. I attempted to procure ease by giving opiates, and applying fomentations, and did not immediately try to reduce the prolapsed part, having before the operation found such attempts ineffectual. However, the prolapsus continued so long, that the appearance of the part began to alter; and I saw it would be hazardous to permit the rectum to remain any longer in this situation.

16th. This day at noon I made an attempt to reduce the intestine, and succeeded with the greatest ease. After the reduction Mr. W. complained of so much pain in the *hypogastrium*, that in the evening I thought it proper to bleed him, and to purge him gently with the *ol. ricini*.

These means afforded the desired relief, and the succeeding evacuations by stool did not again bring down any part of the rectum. But, as some pain in the lower belly succeeded the evacuations, I thought proper to restrain this by giving an opiate. I directed a mild and slender diet, the drinking of linseed tea, *lac amygdalæ*, &c. gave a little *ol. ricini* every morning, or every other morning, and gave an opiate after a stool had been procured. By proceeding in this manner for some days, regular stools were procured without any permanent inconvenience. My patient recovered very well, and was freed from this distressing complaint, which had afflicted him so many years.

In March 1789, I received a letter from Mr. W. of which the following is an extract:

“DEAR SIR,

“Agreeable to your kind request I sit down to inform you how I go on. For some time past I have been very regular in my body, having generally had a call every day, so that I have seldom had occasion to use the castor oil. I apprehend I am now nearly the same as before the complaint commenced; only, that I conceive the contraction occasioned by the operation is still greater than is natural: but I find very little inconvenience from that, as I guard against costiveness. In one instance I am perhaps somewhat different from others; that is, immediately after an evacuation the lips of the anus (as I conceive) contract hastily, and in that contraction give a little sharp pain, but it is over perhaps in less than a minute. I never bleed now; nor do I perceive any symptoms of my old complaint,

“ for which I desire to be ever and unfeignedly thankful.
“ It is a blessing which I trust I shall never forget.”

In May 1791, I had the pleasure of a visit from Mr. W. who then informed me, that he continued well. He said he felt a very small protuberance at the anus, not longer than an eighth, or at the most a quarter, of an inch, when he went to stool; especially if he strained more than usual. But this went away immediately after the evacuation, and gave him no trouble.

CASE II.

Mr. K. of Wetherby, consulted me in October 1790, on account of a troublesome *procidentia ani*, attended with frequent bleeding, and with the external piles. He had been subject to discharges of blood, at times, upon going to stool, for twenty years. The piles had frequently burst, and then becoming flaccid they grew easy, and he felt no inconvenience from them for a time. During the last two years they had continued to increase in size, and had not burst as usual. They were become so troublesome, that he could neither ride nor walk with ease.

I found several soft tubercles situated at the verge of the anus. Those which were the most prominent were situated on one side of the anus; on the opposite side there were none very prominent.

I recommended the operation which I had performed in Mr. W's. case, and with the consent of my patient I extirpated the larger tubercles on one side of the anus.

The part was healed at the end of three weeks, and Mr. K. returned home much relieved. He favoured me with an account of his state in June 1791, and again in September 1792. In these letters he informed me, that the operation had answered his expectation, so that he could ride or walk without the least inconvenience. However, the small tubercles which were left had rather increased in size, and sometimes discharged blood. The part on which the

operation had been performed remained smooth, but was not free from occasional discharges of blood.

He continued to have a slight degree of prolapsus upon going to stool; but even when the fœces were hard the gut ascended speedily, and without assistance.

He concludes his last letter by saying, "I am well satisfied with the operation."

CASE III.

January 28th, 1791, Mr. E. of T. consulted me on account of a disorder which he called the bleeding piles, and gave me the following relation of his case.

For three or four years he had been subject to bleed at the anus upon going to stool; at which time he felt an unusual pressing downwards. But it was not till within the last five or six months that he was conscious of any descent of the gut: during which time it had descended always when he went to the vault, and he seldom failed on that occasion to bleed considerably. The blood flowed from him in a stream; and the hæmorrhage had increased to such a degree, that according to his own estimate, he had of late lost near a pint of blood at a time. Of this, however, he could not be certain; as he never made use of a close stool. He could generally reduce the prolapsed part by gentle long continued pressure; but sometimes it remained down for twenty-four hours, during which time he had a copious discharge of bloody serum.

He usually had a stool every second or third day.

These frequent and large bleedings had reduced him, and made him weak; yet his pulse was not frequent, nor very feeble. He had consulted a physician and surgeon in the neighbourhood; but, as the latter informed me, no examination had been made of the parts affected. When I visited him this day at T. I examined the state of the anus, and found no protrusion of the interior parts; but there was a pendulous flap of integuments, about three-

fourths of an inch in length, which in part surrounded the anus. As he had no stool while I remained at his house, though I staid all night there, I could form no judgment of the prolapsus but from his own account.

I advised him to inject every other day a mild clyster, made with a pint of water-gruel and a large spoonful of treacle; and to take in the morning, a few hours before the injection of the clyster, a dessert spoonful of castor oil. I cautioned him against sitting long at the vault, or using any straining efforts. I informed him that the prolapsed intestine would produce a sensation as if he had not discharged all the fœces; and begged that he would be particularly aware of this deception, lest he should increase the hæmorrhage by unnecessary strainings. I advised him to wash the prolapsed part with the astringent lotion which I had recommended to Mr. W. (Case I.); and, until that could be prepared, to make use of brandy in the same way. And I recommended to him to reduce the intestine immediately after the washing, which was to be used as soon as the fœces were discharged; that, if the hæmorrhage should return, it might be suppressed as soon as possible.

This method of treatment prevented the return of the hæmorrhage, but did not cure the prolapsus. Mr. E. afterwards informed me, that he thought he had greater difficulty in reducing the prolapsed intestine after he had used the astringent lotion for a week or two.

Finding the complaint at a stand, he came to Leeds on March 14th, that he might be more immediately under my care. He then complained of constant uneasiness at the anus: and, upon examination, I found engaged within the sphincter ani a small portion of intestine, the extremity of which was visible externally, and had a livid hue. I was of opinion, from the account which he gave me, that this part had remained prolapsed during the last six or seven days. I informed him of his situation, and advised him to reduce the part immediately. His bowels were kept open; and he was enjoined to abstain from exercise until this part should have regained its natural state.

At the expiration of a week I carefully examined the affected parts, after he had walked awhile abroad, and found a small portion of the intestine adhering in one part to the sphincter ani. This adhering portion I extirpated with a pair of scissors; hoping that the removal of it might allow the rectum to retire into its natural position, and perhaps might prevent the *procidentia*. At any rate I thought it right to use first a method more gentle than one which I had in view, and which I reserved to the time of necessity.

This treatment afforded no relief; but the intestine descended as usual when the patient went to stool. I now determined upon using the method which had succeeded so well in the two preceding cases.

Friday, April 8th, after having informed my patient of the nature and necessity of the operation which I proposed for his relief, and encouraged him with the hope of a favourable termination, I removed the pendulous flap close to the anus, and cut off about a quarter of an inch of the interior red lining of the sphincter ani, formed by the extremity of the intestine, which was rather loose, and projected a little. A small artery was opened on the left side, which bled freely for a short time; but, as the extremity of it lay loose without any immediate connexion with the cellular membrane, and as it soon ceased to bleed, I did not apply a ligature.

About an hour after the operation, I was sent for in haste, and found the wounded parts bleeding freely. I was obliged to take up, with a needle, a blood-vessel on each side of the anus. The application of the ligature was attended with considerable difficulty, and could not be effected until an assistant had separated the wounded parts as much as possible.

Sunday 10th, Mr. E. took a table-spoonful of *ol. ricini*, and had a stool, without either hæmorrhage or descent of the intestine.

Tuesday 12th, he took another dose of the oil, and had three stools in the course of the day. At the third stool, which was attended with unusual irritation, the *procidentia*

ani returned. I was not informed of this event until Wednesday morning, when I effected the reduction of the intestine without difficulty.

Wednesday noon I found the gut in its prolapsed state again, and was informed, that it had come down almost immediately after I had left my patient in the morning. Mr. E. had also reduced it, but without any permanent good effect. The parts were now very sore, and the intestine had begun to change colour. I gave him Tinct. Opii gr^{ss} xx, to remove the uneasiness, which was constant; and advised the application of a poultice of milk and bread, to abate the soreness.

I found him much easier in the evening, but the gut was in the same state. I thought it better to try the effect of cold applications, than to repeat the handling of the parts; and desired him to keep cloths dipped in cold water constantly applied, and to change them frequently.

Thursday 14th. He had had much headach in the night, and had been restless; yet his pulse remained calm, and he had very little uneasiness. The gut was in the same state. He had used the cold wet cloths in the evening for two hours, but without the desired effect. I again replaced the prolapsed part of the intestine, which was about the size of a large nutmeg; and held the part in its natural situation for a minute or two.

In the afternoon I repeated my visit, and had the satisfaction to find that the natural contractile power of the intestine had effected what I had attempted in vain. The gut had descended soon after I left him in the morning, as my patient thought, but had afterwards retired spontaneously, after having been down, in general, for forty-eight hours.

After this time the *procidentia ani* returned no more; but the cure proceeded as well as I could wish. I directed a laxative clyster every other day, to procure an easy motion; but did not permit Mr. E. to take the castor oil, or any other purgative, until the parts were healed. He was perfectly well at the expiration of three weeks after the last operation.

CASE IV.

William Willans, of Hunstlet, weaver, aged thirty-three years, was admitted a patient of the General Infirmary at Leeds, under the care of Dr. Davison.

As he complained of a frequent *procidentia ani*, I was desired to examine the part. I found a tumour about the size of a large nutmeg, consisting of a portion of the rectum inverted, which had descended on the right side of the anus, and adhered to the integuments, which immediately surround the anus, on that side. The integuments made a pendulous flap when the intestine was prolapsed; but when it was reduced, that flap was drawn inwards, and the anus had its natural appearance. A portion of the villous coat of the rectum, about the breadth of a silver three-pence, was abraded. The patient gave me the following history of his complaint.

About thirteen years ago he began to be afflicted with the bleeding piles, having some pain and hæmorrhage when he went to stool. He had rarely an evacuation without a discharge of blood, which sometimes flowed from him in a stream. He was not then sensible of any descent of the intestine; but about ten or eleven years ago a portion of the gut began to descend at every evacuation. This descent was not, however, confined to the times of his going to the vault; it came on also while he was employed in labour. The complaint gradually increased; but was not always equally troublesome. Sometimes he was free from the prolapsus for a week or two, except when he had a stool: at other times the gut would descend repeatedly in the space of an hour, while he was sitting employed in his occupation of a carpet weaver. Now and then the part became so sore with the frequent reduction, that he was under the necessity of suffering it to remain prolapsed, until rest in a horizontal posture had so far abated the soreness, that he could bear the pain of attempting its reduction.

Since he came into the Infirmary he had been unable to pump water into a cistern, without bringing on the procidentia ani.

This disorder had reduced his strength considerably, so that he was almost rendered unfit for the prosecution of his usual employment.

September 10th. I requested a consultation of the other surgeons who attend the Infirmary; and after informing them of the success which I had met with in the cure of this obstinate disease, by the method related in the preceding cases, I proposed making use of the same for the relief of this patient. Mr. Lucas recommended the separation of the intestine from the flap of integuments, without the excision of any part, as a method likely to give less pain to the patient, and to prove equally successful. In compliance with his advice, I made such a separation, and then reduced the intestine.

This operation proved rather more tedious than that of excision. The intestine descended about two hours after the operation, although the patient had remained in bed in a horizontal position.

Whenever he had a stool, whether spontaneously, or by the assistance of laxative medicines given internally, or by clyster, the evacuation was attended, except on one day, with a descent of the intestine.

The wounded parts were healed in the space of three weeks. The gut continued to come down whenever he had a stool; but he could reduce it with more ease; and when he left the Infirmary he had no prolapsus except at the time of going to stool. He did not choose to submit to any farther operation in order to obtain a more perfect cure.

In the beginning of January 1792, he called upon me, to inform me, that the intestine had begun to descend a little now and then, when he did not go to stool. I advised him to use the astringent wash, made with infusion of oak bark in lime water, &c. as mentioned above.

CASE V.

The following case is so well described by the lady who was the subject of it, and who wrote it down at my request after her recovery, that I have nothing to add but an account of the means used for her cure.

“ DEAR SIR,

“ If I could have the most distant hope, that a statement of my case would be of use to any of my fellow creatures, it would be a great gratification. The consideration that it is possible you may have a similar case, is a great inducement to me to make an attempt to describe my truly distressing situation, though I am sensible I am very unequal to the undertaking.

“ It is more than twenty years since my complaint first made its appearance. At first a small part of the seat came down when I had an evacuation, but when returned gave me little pain or inconvenience. It continued in this state some years. Afterwards the part became more relaxed, and frequently came down when I walked, or stood, particularly in warm weather. After I had continued in this situation some time, the part became very sore, and came down in a much greater degree, and I had very frequent bleedings, and during the discharges I was generally reduced very low and weak. Sometimes I have been a month or six weeks without any returns of the bleeding.

“ In October last the soreness and bleeding came on in so terrible a manner, I was reduced to the greatest distress and weakness. I daily lost six or eight ounces of blood when I had an evacuation, and the pain would continue many hours so violent, I was under the necessity to press upon the part, which was the only relief I had.

“ In January (1799) I came to Leeds. It is unnecessary to say what was done there.”

The lady was at this time much reduced by the frequent and copious hæmorrhages from the rectum. I found, upon examination, a soft tubercle on two opposite sides of the anus, which did not retire along with the prolapsed parts of the rectum. These I extirpated, but at different times, wishing to try whether the removal of one of them might not bring on a sufficient stricture, upon healing, to support the extremity of the rectum. The good effects produced by these operations are described in the subsequent part of her letter, in the transcript of which I shall omit one sentence, as it only contains the effusion of kind partiality.

“ I am now by the blessing of God, and the means used, wonderfully restored. I can now walk as far as my strength will allow, without any inconvenience from my old complaint, though it yet comes down in a small degree when I have an evacuation, but never at any other time. I have had no return of the bleeding, or soreness, and at present I am very comfortable, and I have every reason to hope I shall continue so. . . .

“ I did not think I was within the reach of human aid. I have only to regret that I did not apply sooner, as my constitution would not have received so severe a shock, as I am sensible it has done from the long continuance of my complaint. I am yet weak and low, and I have not the perfect use of my legs; but I am happy to say I recover daily, and I trust I am again to know the blessing of health.

“ I am, &c.

“ June 26th, 1799.

“ J. T.”

TUMOUR IN THE RECTUM.

CASE VI.

In October 1764, I was consulted by William Hargrave, of Bramley, near Leeds, on account of his son, about eighteen years of age, who had had for two years a tumour in the rectum, which was protruded without the anus, whenever he had a stool, and generally discharged blood at those times. This complaint had been attended from its beginning with pain in the lumbar region, which commenced upon his receiving a blow on that part as he was stooping. He had never been healthy since this accident. His appetite was great, but he was soon faint after eating. He was extenuated, and had lost much of his strength.

I desired the young man to sit down upon a close-stool, containing a little warm water, and to use such efforts as he knew would bring the tumour into view. I found it to be about the size of a nutmeg, adhering to the intestine by a narrow basis. In its appearance it resembled a large pile; but was of a firmer texture than the piles usually are, unless when inflamed.

I recommended the extirpation of this tumour; but did not think excision to be advisable, as it would have been very difficult to restrain a hæmorrhage in a part of the intestine so distant from the anus, as that occupied by the basis of this tumour. I therefore made a ligature round the basis, and then pushed up the tumour into its place above the sphincter ani. On the third day I found the tumour much shrivelled, and applied a second ligature. Neither of these operations gave my patient any considerable pain.

On the 5th, the father of the young man informed me, that the ligatures had come away without his son's knowledge, who was now quite easy.

The hæmorrhage returned no more after the extipation of the tumour, and the young man soon regained his perfect health.



CHAPTER XII.



OF THE CANCER OF THE PENIS.

CASE I.

WILLIAM BROMITT was admitted into the General Infirmary at Leeds in 1774, for a cancer of the penis. He had from his infancy been subject to a natural *phymosis*, so that he had never been able to draw back the prepuce. The disease began by a painful swelling of the extremity of the penis; on which account the prepuce had been divided in three places by a Frenchman, who then practised surgery at Wakefield.*

From the time that these incisions were made, a large irregular fungous had sprouted out from the extremity of the penis, which continued spreading, till it had occupied all that part of the penis, which naturally projects beyond the scrotum. Neither the prepuce nor the glans penis could now be distinctly perceived; but the whole projecting part of the penis formed a confused mass of irregularly granulated flesh, which discharged a very fetid matter. That part of the penis which was covered by the scrotum

* This account I received from the patient, who, not being able to denude the glans penis, might not know whether the disease originated in the prepuce or in the glans.

and perinæum appeared to be sound, being free from any morbid hardness. I extirpated the penis close to the upper part of the scrotum. One artery on the dorsum penis, and one in each corpus cavernosum, bled freely; so that I was obliged to apply a ligature to each vessel.

I apprehended that it might be of service to my patient, in this case, if the extremity of the urethra was suffered to contract itself; as the urine would then be projected to a greater distance, and would not be so apt to run down the scrotum. I therefore omitted the introduction of a bougie, till he began to complain that he could not make water without some difficulty. I now found that I had too long deferred the introduction of a bougie, as the urethra would scarcely admit a very small one. I directed that a small bougie, about an inch in length, should be retained in the urethra. But, about twelve hours after its introduction, the patient was seized with a shivering, succeeded by feverishness. The bougie was then withdrawn, and a cooling laxative was administered. The complaint went off in a few days, though not without a small discharge of purulent matter from the urethra. He made water with less difficulty afterwards.

He was discharged, cured, a month after the operation. The urine flowed in a small stream when he made water; but it was projected to a considerable distance from the penis, when he drew up the integuments covering the pubes.

About a month after his discharge from the Infirmary he applied to me, requesting that I would introduce the bougie, as the urethra had again become more contracted. The introduction did not give him pain, but brought on a feverishness, as it had done before.

I advised him to continue the occasional introduction of a short bougie.

I saw this patient some years afterwards; and he had then suffered no return of the cancerous complaint.

CASE II.

In the spring 1779, Mr. M. of N. W. consulted me on account of a cancerous excrescence, which occupied the whole of the glans penis, and a part of the corpora cavernosa. The disorder had appeared about a year before, and had commenced by a discharge of purulent matter from the extremity of the prepuce. He had a natural *phymosis*, so that the state of the glans penis at that time could not be seen. His complaint was treated as venereal by the surgeon whom he first consulted. Finding no relief, after a trial of some months, he consulted another surgeon, who divided the prepuce, and attempted to bring on a salivation. A considerable degree of inflammation was the consequence of this treatment; and a third surgeon was consulted: who, after removing the inflammation by emollient applications, tried to bring on a healing of the sore by digestives and gentle escharotics. The complaint being rendered rather worse by these applications, he desisted; and treated the disorder as cancerous, by applying the cicuta externally, and giving it internally in large doses joined with the bark. The patient received no benefit from these remedies. He had been much reduced, as he informed me, during the treatment with mercurials; but had regained his flesh when he came to Leeds, and a good countenance.

There was a part of the penis between the cancerous excrescence and the pubes, which appeared to be in a sound state. The rest of the corpus cavernosum and urethra was also free from induration.

So far the case seemed proper for amputation. But there was a hard tumour, about the size of a horse-bean, in the integuments covering the ossa pubis, which made me fear a return of the complaint. However, as there was not the least hope of a recovery by any other means, and as the small tumour admitted of extirpation, at the request

of my patient I performed the operation, and extirpated this tumour, as well as the diseased part of the penis.

I rolled a piece of tape round the sound part of the penis; which enabled me to extirpate with more precision just so much of the integuments, and body of the penis, as I wished to remove. I cut off, not only the excrescence, but also all that part of the penis which was covered with discoloured integuments. The hæmorrhage was considerable; the blood not only flowing from many conspicuous arteries, but oozing largely from the divided corpora cavernosa. I took up one artery in the dorsum penis, and one in each corpus cavernosum. The bleeding, which still continued, seemed then to be a general oozing from the wound: on which account I applied the sponge in the manner recommended by Mr. White.

About an hour after Mr. M. had been put to bed, the bleeding became considerable again; and I was obliged to remove the dressings, and to take up three other arteries. A fourth vessel, which seemed to run in the septum of the corpora cavernosa close to the urethra, bled a little; but, as I could not discover clearly its extremity, I contented myself with applying a piece of sponge to the part whence the blood issued.

On the third day after the operation, a fresh hæmorrhage came on, which compelled me to remove the piece of sponge that I had applied, and which now adhered closely to the wound.

The hæmorrhage arose from that artery in the septum which I had before seen indistinctly, but which now bled freely.

The cure proceeded very well; except that the wound in the pubes, made by the extirpation of the small hard tumour above mentioned, remained in a foul state. The application of the *pulvis angelicus* brought the sore into a clean state; and it afterwards healed.

I made use of a bougie occasionally, though the extremity of the divided urethra did not contract so much as in Bromitt's case.

Though the excision was made at such a distance from the pubes, as to permit me to apply a piece of tape three quarters of an inch in breadth round the sound part of the penis; yet immediately after the operation the penis became retracted within the scrotum; and a hollow, instead of a projection, remained after the cicatrization of the wound.

Mr. M. was under the necessity of using bougies occasionally after his return home; but I never heard that he had any return of the cancerous disorder.

CASE III.

In July 1781, T. M. Esq. of A. consulted me on account of an excrescence within the prepuce, which he had discovered a few months before. It was hard, and had an uneven surface. It was attached both to the prepuce and glans penis. I could see a part of it, though he could not denude the glans, having had from his infancy a natural *phymosis*. A large quantity of fetid ichor was discharged from the diseased part.

I could not doubt that the complaint was of a cancerous nature, and therefore I advised extirpation as the only method of cure which was likely to prove effectual.

This gentleman was in the sixty-third year of his age, and seemed to have a good constitution. He was subject to discharge small sand in his urine; and had sometimes slight attacks of the gout.

I performed the operation in August. The arteries which ran in the centre of the corpora cavernosa penis gave me no trouble. But I was obliged to take up four which ran upon the dorsum penis.

I made an attempt to heal the wound by the first intention; and, for that purpose, I brought the integuments over the divided corpora cavernosa, securing them, as well as I could, with court plaster. That I might make the integuments lie upon the wounded extremity of the penis without puckering, I made a longitudinal division of them at the inferior part of the penis; by which method I could cover the corpora cavernosa without covering the urethra. I introduced a small silver canula into the urethra; that the integuments might not slide over the extremity of that canal, and that the least possible disturbance might be given to the parts in his efforts to make water.

Whenever my patient made any exertion, the blood gushed out from the corpora cavernosa; but there was no bleeding while he lay still in bed. I directed an assistant to place his fingers upon the extremity of the corpora cavernosa whenever Mr. M. had occasion to make water, or to use any other exertion. This attention was necessary during two or three days after the operation; at the end of which time the oozing of blood ceased.

I was disappointed in my design of healing by the first intention; for the integuments would not adhere to the extremity of the corpora cavernosa. These spongy bodies, when divided, do not readily throw out granulations; but have usually for some time an ill-conditioned appearance.

I removed the canula, and dressed the wounded parts with digestive; covering the whole with a soft pledget of cerate, and introducing a short bougie daily, as the urethra shewed a great tendency to contract itself.

The wound was cicatrized at the expiration of five weeks; and the remaining part of the penis did not retire within the scrotum.

This gentleman had never any return of the same disease in the penis, nor elsewhere. He died some years afterwards from a stone in the bladder, and general debility.

Upon examination after death, I found the stone formed somewhat like an hour-glass, and retained in one position by the contraction of the bladder upon the middle part of it.

CASE IV.

Austin Wray, a middle-aged labouring man, was admitted a patient of the General Infirmary at Leeds in 1782, for a cancer of the penis. He had had the disease about a year and a half before his admission. The parts were in a state of great inflammation, from the application of some escharotics, which had been used by an ignorant quack whom he had lately consulted. The glands in the right groin were likewise much tumefied.

Emollient poultices and cooling medicines were administered, to take off the inflammation. These means produced their intended effect; but the induration of the inguinal glands remained.

A consultation of the surgeons of the Infirmary was held upon the case of this poor man. As we had no hope of curing this ulcerated cancer by any remedies yet known; as the penis, betwixt the excrescences and the pubes, appeared to be in a sound state; and as the inguinal glands had not become enlarged until the application of the escharotics; we judged it proper to propose the amputation of the diseased part to our patient.

I performed the operation September 5th, and was obliged to take up six arteries between the integuments and the corpora cavernosa. The artery, which runs in the centre of each corpus cavernosum, did not require a ligature.

I was obliged to make frequent use of a short and thick bougie during the cure. Whenever this was omitted the man found a difficulty in making water. The wound was cicatrized in the space of five weeks.

I gave him the *Extractum Cicutæ* for some time after the wound was healed. The enlargement of the inguinal glands gradually lessened for a time; but afterwards increased considerably. The man became weak and languishing, and died from a return of the complaint; though there was never any fresh ulceration.

CASE V.

In 1801, J. L. of Leeds, an elderly man, consulted me on account of some excrescences on the extremity of the penis. They were evidently of a cancerous nature, and appeared to be confined to the prepuce, the greater part of which was in a morbid state. He did not remember ever to have been able to denude the glans penis. He readily submitted to the operation which I judged necessary to effect the cure of his disorder. My design was to have removed those parts only of the prepuce which had a morbid appearance; but upon attempting this I found, that a part of the prepuce adhered to the corona glandis, and had brought it into a state of ulceration. I thought it necessary therefore to extirpate the extremity of the penis as well as the prepuce, the internal membrane of which was in a more rigid state than is natural. I was obliged to take up several arteries. A bougie was frequently introduced into the urethra during the cicatrization of the wound.

CASE VI.

Mr. H. of Tanfield, near Masham, consulted me in July 1801, on account of some painful ulcerated excrescences at the extremity of the penis, and gave me the following relation of the origin and progress of his complaint.

He had a natural *phymosis*, having never been able to denude the glans penis. About two years and a half

before he consulted me, he began to find great difficulty in making water. At this time there was no appearance of disease in the penis; at least, none had been discovered; but the dysfury was attributed to the gravel.

After some time, one of the medical gentlemen whom he consulted, found, upon examining the penis, that the prepuce was in a diseased state, and made a division of it on one side, which greatly relieved the dysfury. Some excrescences were now discovered, arising from the interior surface of the prepuce, and these had continued to increase in size and foreness from the time of their discovery.

These excrescences appeared to me to be of a cancerous nature. They were in a sordid state, and occupied the inferior and lateral parts of the prepuce. The superior part of the prepuce appeared free from disease, the extent of which could not, however, be clearly ascertained, as the glans penis could not yet be completely denuded. I divided the prepuce in a part which was sound, and at some distance from the former division which was incomplete, that I might see whether the glans remained in a sound state. Upon drawing back the prepuce completely, I could perceive no disease in the glans; but the frænum was ulcerated.

I extirpated all the diseased part of the prepuce, leaving only that sound part which remained between the two divisions. The frænum was also removed.

The wound put on a favourable aspect, and healed speedily, so that it was nearly cicatrized at the expiration of a fortnight after the excision.

March 23d, 1802. This patient lately informed me, that he had continued perfectly well since his return home.

CASE VII.

A young man, by trade a shoemaker, consulted me on account of a great difficulty in making water, which

was attended with some pain at the extremity of the penis.

Upon examination I found the prepuce so much contracted, that it would scarcely suffer the urine to flow out. When I introduced a probe within the prepuce for the purpose of examining its state, I found it to have an unnatural rigidity. The *phymosis* I apprehended to be congenital, as the patient did not remember to have been able at any time to denude the glans penis. I urged the necessity of dividing the prepuce, and he consented to the operation. Upon making a complete division of the prepuce laterally, on each side, I found its interior membrane much more firm and rigid than it is in its natural state, so that it greatly resembled a piece of fine parchment. Minute tubercles appeared here and there on its internal surface; but none of them seemed tending to ulceration. I did not remove any part of the prepuce; but left it in such a state that the glans penis might be denuded with ease.

This operation was performed several years ago, and I have heard nothing of the patient since his cure was completed.

REMARKS.

The preceding cases of cancer in the penis afford a pretty good history of the origin and progress of the disease, when affecting this part of the body. Six of these seven patients had had a congenital phymosis, which was certainly an extraordinary circumstance if it had no relation to the origin of the disease. The disease had made such progress in some of the patients, as to destroy entirely the natural appearance of the parts, before I had the opportunity of examining them: nor could I learn in these cases, how the prepuce appeared before, or at the first attack of the complaint. Where I had an opportunity of seeing the disease in an early stage, the phymosis evidently appeared

to have been caused by a mal-conformation of the internal membrane of the prepuce; and the mal-conformation seemed also to have given rise to the cancerous affection.

In the seventh case we see the disease in its first stage. The whole lining of the prepuce was in an unnatural state. But as this seemed to have been congenital, and as the tubercles were so minute, that they appeared like mere inequalities in the thickness of the membrane, I did not think it necessary to perform the operation of circumcision. Whether the operation which I performed put a stop to the progress of the disease I cannot tell. The young man was a journeyman shoemaker, and lived in lodgings. I have lately tried to discover his residence; but have not been able to gain any information respecting him.

The sixth case shews the disease fully formed, but not much advanced in its progress. The whole of the prepuce was not affected, and the glans penis remained free from disease.

In the fifth case the disorder had made a little farther advance, and had begun to affect the glans penis; but the morbid affection had pretty evidently commenced in the prepuce, and had spread from thence to the glans penis.

I believe I should not have performed the operation in the fourth case, had not the swelling of the inguinal glands been so recent, and brought on, as we judged from the patient's account, rather by the injudicious application of escharotics, than by a simple extension of the disease.

The permanent cure effected in the three first cases by the operation, shews that the amputation of the morbid part of the penis affords great hope of success in this species of cancer.

In amputating the penis, I found great advantage from having wrapped some tape round the sound part. I was hereby enabled to divide the integuments more easily, and correctly; and I was also furnished with an useful kind

of tourniquet, which secured the divided vessels from bleeding, till I was prepared to take them up with the tenaculum and ligature. It requires great care in this operation to secure the larger arteries, as they are apt to shrink, and conceal themselves under the loose integuments, to which they have no strong attachment.

CHAPTER XIII.

CONVULSIONS AFTER STRANGULATION.

MAY 18th, 1782. In the evening Mr. ——— being greatly distressed on account of some disagreeable circumstances in business, rashly hanged himself. He was discovered by his son soon after the commencement of his suspension, and on being cut down shewed some signs of life.

A surgeon, who lived near him, was immediately sent for: who, finding him lying insensible, and frothing at the mouth, and not being informed of the cause of these symptoms, took about a pound of blood from the arm. Soon after the evacuation Mr. ——— was seized with convulsions. A blistering plaster was then applied betwixt the shoulders; and some spirit of hartshorn was sent, with directions to give a little in water whenever it could be got down. When the convulsions had continued an hour without intermission, I was desired to visit the patient, having attended the family in ordinary for some years.

I found him lying on a bed, which was placed on the chamber floor near an open window. He was insensible,

and violently convulsed. His hands and feet were cold; the rest of his body was hot, and in a profuse perspiration. He was held down by five or six stout men, to prevent any injury to himself from the violent and almost incessant agitations which he suffered.

I was of opinion that these convulsions were the effect of debility, brought on by the suspension, and probably increased by the copious evacuation of blood. I determined therefore to give him some stimulating medicines as soon as he could swallow them; and that I might be ready to seize the first opportunity, I sent for some *Æther*, *Spt. Ammoniaë*, and volatile Tincture of Valerian.

I requested a consultation, and the late Dr. Hird was desired to attend. In the mean time I directed the patient to be placed in warm blankets upon his own bed, and wrapped his feet in hot flannel. Just before his removal I made an attempt to give him some warm wine, and succeeded in getting down a few ounces, by putting a large spoon betwixt his teeth during a short interval of quiet, and pouring the wine into the spoon while his teeth were kept asunder by it. As soon as the wine was swallowed he belched, and seemed to be somewhat relieved.

When Dr. Hird arrived, I informed him of what I had done. He concurred with me in the mode of treatment which I had adopted, and we determined to give our patient the volatile Tincture of Valerian in warm wine, as speedily as possible.

The assistants having placed him in a sitting posture in bed, I poured into his mouth, at two or three trials, about two drachms of the tincture, diluted with wine. No sooner had he swallowed this mixture than the convulsions ceased instantaneously. He was laid down in bed, and we gave directions that a tea-spoonful of the tincture should be given now and then, or as soon as ever the convulsions should return.

I was called to visit him again betwixt one and two o'clock in the night, and was informed, that he had lain

quiet during two hours after Dr. Hird and I had left him at nine in the evening. The convulsions then returning, the Tincture of Valerian was given, and the same pleasing effect was produced, viz. an immediate cessation of the agitations. The convulsions, however, returned twice; and the last interval of ease having been but a quarter of an hour, I was requested to direct what might farther be done for his relief.

Mr. — was now in so tranquil a state, though insensible, that the use of the warm bath (which I had mentioned before) was no longer impracticable. He was placed in a semicupium as soon as it could be got ready, and a large blistering plaster was applied to his head. Sinapisms were also put to his feet.

19th. At nine in the morning we found him better. He had had no convulsions since the use of the warm semicupium. He had spoken a few words sensibly, and began to complain of the blisters. He discharged part of his urine involuntarily. His pulse was at ninety-six, with a moderate degree of strength. As he had had no proper evacuation since the injury, the following bolus was ordered:

℞. Pulv. Rhei gr. xxv.

. . . Zinzib. gr. v. fyr. simp. q. f.

f. Bolus statim sumend.

A saline julep was also prescribed: thin broth, chocolate, and the like, were ordered for diet.

5 P. M. He had retched after taking the bolus, but had had a stool. He was now so sensible that he could give a proper reply to questions respecting his feelings; but he had a staring and hollow countenance. The mark of the cord had not yet disappeared. Though much recovered since the morning as to his understanding, yet he was now in a more languid state. His fingers, from their extremity to the middle joint, were pale as if benumbed with cold; and his pulse was so feeble that it could scarcely be distinguished. In this state it seemed absolutely neces-

fary to do something to rouse the *vis vitæ*. A cordial draught, containing Tinct. Valer. volat. ʒj, was ordered to be given every four hours; and a little wine was directed to be given to him frequently.

20th. The draughts had agreed very well. The pallid appearance of his fingers was gone; and his pulse had considerably increased in strength. His understanding was become quite clear. The draughts were continued every six hours.

From this time he recovered very well, except on account of a gangrenous slough, which came upon the side of each foot. The sinapisms had been suffered to remain so long upon his feet, until they had caused a blister to rise upon the side of each foot. Upon his beginning to walk about in his chamber, an inflammation came upon the blistered parts, and was succeeded by a superficial gangrene. By keeping him in bed, applying mild cataplasms, and giving him the Cortex Peruvianus, the sores became clean. Flannel rollers were then used, with proper dressings, and he was permitted to walk about. The sores healed slowly; but he regained his health.

REMARKS.

This case clearly points out the impropriety of large and indiscriminate bleeding after strangulation, while the powers of life remain almost suspended. The extraction of a small quantity of blood from the jugular vein, especially in a plethoric habit, might do good, when accompanied with the internal use of volatile, and other stimulating medicines.

The great advantage of these remedies was evident, both in the first instantaneous removal of the convulsions, as soon as the medicine reached the stomach of the patient; and in the removal of that alarming debility which came on upon omitting for a time to give the volatile tincture and wine, on the day after the accident.

The sinapisms ought not to have remained upon the feet so long as to vesicate the parts. Ulcers produced by blistering the feet are often slow in healing, in persons of a languid habit.

This case throws some light upon the proper mode of treatment after suffocation, and concussions of the brain. In both these instances I think copious bleeding to be injurious during the diminished state of the *vis vitæ*, which immediately succeeds the injury. In concussions of the brain I have seen great benefit arise from the warm semicupium, and blistering the head, after topical bleeding.



CHAPTER XIV.



OF A TUMOUR IN THE NECK.

SEPTEMBER 28th, 1785, the late Rev. Mr. Eyre and his lady brought their youngest child, aged four months, from Barnborough, to consult me about a tumour which had appeared on the left side of the neck, just above the clavicle. The maid first perceived this tumour four days before, as she was washing the child's neck. The tumour was now about the size of a pigeon's egg, though much smaller when it was first discovered. It had a bluish appearance, somewhat like a vein; was quite soft, and free from pain. It gave no impediment to the motion of the head. It was moveable, but not detached from the subjacent parts. It seemed to be the most tense when the child cried. Nothing had happened to the child in any

respect remarkable, except, that about a fortnight before this tumour was perceived she had cried, or rather screamed out suddenly and violently. Upon undressing her immediately, nothing was perceived that could have hurt her. It was supposed she had been frightened, as she continued to moan for a few hours, and then returned to her usual cheerfulness.

From weighing all these circumstances I was inclined to consider the tumour as arising from a varicose distention of the veins of the neck, perhaps of the external jugular vein, as the tumour was situated upon the course of that vein. I was inclined also to attribute the origin of this disease to the violent fit of crying above mentioned, as the veins of the neck are much distended at such times, and might be rendered varicose by the violence of the effort.

As I had seen two instances, not long before, of soft tumours in the same part of the neck, which I considered as varicose, one of which gradually subsided, and the other remained without injury to the patient; I advised nothing for the present, but washing the part frequently with cold water. I hoped that a little time would fully elucidate the nature of the complaint.

A week after this examination, I received a letter from Mr. Eyre, informing me, that the tumour had increased rapidly in their return home, and was now so large as to alarm them much. At the expiration of the second week they returned to Leeds with the child.

The tumour had increased to four times its former size, and the integuments seemed very thin at its most prominent part. It descended a little below the clavicle, and rose as high as the angle of the lower jaw.

There was now reason to believe that the fluid in the tumour was extravasated; I therefore proposed to puncture the tumour with a small couching needle, to ascertain the nature of the fluid contained in it. If blood should flow out, the discharge might easily be restrained, and we could afterwards act as circumstances might direct. I de-

fired a consultation, both on account of the obscurity of the case, and that I might have proper assistance if it should be found needful to open the tumour more largely, for the purpose of taking up any ruptured blood-vessel.

The late Mr. Billam was consulted, and Mr. Walker, then an apothecary, in St. James's street, London, being at my house, saw the child along with us. Mr. Billam concurring with me in opinion, I punctured the tumour with a round couching needle. Dark coloured blood issued out in a small stream, till the cup had received about a quarter of an ounce; the blood then continued to ooze out for about two hours. The puncture was healed in the course of the day.

The next day (Friday) I punctured the tumour again with a broad couching needle. A smaller quantity of blood issued out, which was not quite so dark coloured. This coagulated soon, whereas the former had remained fluid.

Saturday. We found the tumour not increased in size since the operation yesterday; we therefore deferred making another puncture.

Monday. The tumour had not increased. I punctured with a lancet the middle part, which was softer than the rest. A small quantity of blood was discharged. The remaining part of the tumour, which was now reduced to a small size, was solid, yet soft, as if formed by coagulated blood.

We now entertained great hopes that this formidable disease would give us no farther trouble; but that the remains of the tumour would gradually disappear, or at least remain in this diminished state. But our hopes were soon, for a time, dispersed by an increase of the tumour, which took place within a few hours after the last puncture. The tumour in the course of the day became larger than it had been after the second operation. It continued to increase during the two following days, and then became stationary. We waited about a week, and then made another puncture.

The blood which now flowed out was quite florid, like arterial blood, and coagulated immediately.

After this puncture the tumour had no farther increase. On the contrary, it gradually lessened, and became more moveable. However, I made another puncture with a couching needle; but although I pushed the point of the instrument about a quarter of an inch into the tumour, a few drops only of blood were discharged.

Our little patient was now taken home; the small remains of the tumour were gradually absorbed, and every appearance of disease obliterated.

REMARKS.

The perusal of this case will, I apprehend, leave no doubt in the mind of the intelligent reader, that some blood-vessel in the neck had been ruptured. As the interior part of the tumour was not inspected, the situation and other circumstances of the rupture must be matter of conjecture. It gave me great pleasure to see this alarming disease subdued by such gentle means, as there was at one time great reason to fear, that I should have been under the necessity of laying open the tumour, for the purpose of discovering and securing the ruptured vessel or vessels.

I would take this opportunity of strongly recommending the method here used of exploring the contents of tumours in doubtful cases. I have used it upon several occasions with great satisfaction and advantage. There are few doubtful cases in which any harm could be done by the puncture of a couching needle. The contents of the tumour may be generally ascertained by such a puncture, the pain of which is trifling, and the wound is soon healed.

CHAPTER XV.

OF THE EMPYEMA.

SEPTEMBER 3d, 1788, I was desired by the overseers of the poor of the township of Headingley, near Leeds, to visit John Wilkinfon and his wife, who were then ill in the Influenza, which prevailed at that time. The man had been ill ten days. I found him labouring under a fever, attended with cough, difficulty of breathing, and pain in the left side of the thorax. He was bled once; had repeated blisters applied to the thorax; took nitre and antimonials, with a smooth linctus to allay his cough. He was relieved repeatedly by these means, especially by the application of the blisters; but repeatedly relapsed. At last he became so ill, that he breathed with the utmost difficulty; and could not lie on the right side without danger of immediate suffocation. My eldest son, who was then my assistant in business, had chiefly visited the family; but now desired me to see the poor man, judging him to be in the most imminent danger.

I found him on the 17th of September, and the 27th day from the commencement of his disorder, in the state I have just now described. His face, and especially the eyelid, were a little swoln on the left side. The left side of the thorax was larger than the right, and its integuments were edematose. Upon pressing the intercostal muscles, they felt distended; they yielded a little to a strong pressure, and rebounded again. The abdomen, especially at its upper part, appeared to be fuller than in its natural state.

From these symptoms I was persuaded, that the left side of the thorax contained pus or water; and, after explaining the nature of the disease to the man's wife, who was now perfectly recovered, and to his mother, I proposed the operation for the empyema.

The next day I performed it; having placed him upon a table, covered with blankets, near a window. The pain which he had felt in his side had been the most acute betwixt the fifth and sixth ribs, and there I made an opening into the cavity of the thorax. My first incision was about two inches in length. I cut through the serratus magnus and intercostal muscles close to the upper edge of the sixth rib, and made an opening into the chest capable of admitting the tip of my finger. Purulent matter immediately gushed out to a considerable distance, and the quantity evacuated measured five ale-pints. The poor man was much relieved, yet he did not breathe well during the two first days after the operation. His cough and difficulty of breathing then abated very fast; and his pulse, which, before the operation, had beat one hundred and ten strokes in a minute, soon came down to ninety, and at the expiration of a week did not exceed eighty-four. A leaden canula was introduced into the wound on the second day after the operation, and was retained in its place by a flannel bandage.

Much coagulated matter issued out during the first two or three days, and then the matter became thinner.

My patient continued in a favourable state until the beginning of winter, and then his symptoms became unfavourable. The matter discharged was more copious, and was fetid; his cough was more troublesome, and his pulse became much quicker.

When the cough began again to be troublesome, I prescribed for him an electuary with spermaceti and nitre; but, upon the discharge becoming more copious, thin, and fetid, I ordered a decoction of the bark to be given to him. This was exchanged for a decoction of myrrh, in the proportion of half an ounce to a pint of water. This medicine he

took throughout the month of January, together with half a grain, or a grain, of solid opium every night at bed-time. I requested the overseers to allow him as much new milk as he chose to take, and advised him to make this, with bread and rice, the principal article of diet. These means agreed very well with him, and seemed to be of great benefit to him. In February he ceased taking medicines. As the weather became warmer his strength increased, and by degrees he recovered his health perfectly. I did not permit him to leave off wearing the canula until the discharge from the thorax had ceased, and he had completely regained his strength. He wore it fifteen months.

REMARKS.

When an inflammation of the membrane of the lungs, and of the pleura, produces a mutual adhesion of these parts, and a collection of matter forming a tumour on the thorax; the indication for performing an operation to discharge the matter admits of no doubt. But when the cavity on one side of the chest is filled with any fluid, without a wound or circumscribed tumour exterior to the ribs, more circumspection is required to determine the propriety of an operation.

I have inserted this case as a guide to the young practitioner, and hope that, in this view, it may be of use. Dr. Cullen, in his *Nosologia Methodica*, does not mention the œdema of one half of the body as a symptom of *Empyema*, or *Hydrothorax*. I think it of great consequence to retain a canula in the wound until all probability of a relapse is removed. This precaution, I apprehend, will not hinder the patient from recovering his strength, even when the use of the instrument is not absolutely necessary.

A young man, aged sixteen years, received the whole charge of a fowling-piece into his side, the muzzle of the gun being very near him when it was fired. The greater part of the charge lay under the latissimus dorsi, whence I

cut it out. A small part of the charge penetrated the lungs, obliquely, between the sixth and seventh ribs. The edges of both the ribs were broken. I covered part of the wound with the integuments, uniting them by future. The integuments, by this method, formed a proper support for a canula; which was introduced obliquely betwixt the sixth and seventh ribs. The pipe of the canula made such an angle with its rim, that the shape of the instrument corresponded exactly with that of the wound.

As pellets of lead and small fragments of bone were discharged, now and then, both through the trachæa and the canula, for a long time after the wound was made, I did not remove the canula till the expiration of twelve months after the accident. The canula, during the cure, was taken out every day and washed, that no acrid matter might, by means of it, be detained in the thorax. This patient is now a healthy man; but violent exercise is apt to bring on a spitting of blood. He coughed up several pellets soon after the canula was removed; and there is yet, at times, a slight oozing of serous fluid from the cicatrix.

CHAPTER XVI.

OF AN ENLARGEMENT OF THE MAMMÆ.

MANY circumstances shew, that the *Uterus* and *Mammæ* sympathize with each other, not only in child-bearing women; but various morbid affections of the breasts also indicate a kind of permanent sympathy. I have repeatedly seen the mammæ become enlarged, where there ap-

peared to be no other cause than a deficiency in the menstrual evacuation. The following case of an enlargement of the mammæ, which seemed to arise from an obstruction of the menstrea, is so remarkable, that it may deserve to be recorded.

Mary Bradford, aged fourteen years, was admitted June 8th, 1787, a patient of the General Infirmary at Leeds, on account of a very great enlargement of both the mammæ. From her infancy they had been somewhat larger than the natural size. She was of a delicate habit; but was not unhealthy before the attack of this disease. She began to menstruate when she was twelve years and a half old; and being ignorant of this habit of her sex, and ashamed to mention her situation, she washed that part of her linen which was stained, and continued to wear it while wet. The evacuation ceased suddenly, and had not returned when she became a patient of the General Infirmary.

Many means were used to bring on a regular menstruation, from a supposition that the enlargement of the mammæ was owing to this obstruction. The obstruction, however, was not removed, and the breasts continued to grow larger.

Her situation was now truly deplorable. The size of the breasts was so enormous, that she could not walk upright. The constant bending forwards had brought on a permanent curvature in the spine. The dragging sensation, arising from the weight of her breasts, was so troublesome, that she was never easy unless when lying in bed, or sitting with the breasts resting upon her knees. There seemed to be no method of relief remaining but that of amputation. Upon a consultation it was determined to remove the left breast, which was the larger, and to wait the event of this operation.

There appeared to be no disease in the breasts except that of simple enlargement; and their weight had separated them so far from the subjacent pectoral muscles, that I could push my finger, along with the integuments, some

way behind each mamma, which felt like a bundle of enlarged glands connected together. This detached state of the breasts rendered the operation neither difficult, nor tedious. I left a considerable portion of the integuments to cover the part from whence the breast was removed; and my patient recovered without any bad symptoms. The breast, after amputation, weighed eleven pounds four ounces avoirdupois.

The operation was attended with a success that exceeded my expectation. Menstruation soon returned, and became regular. A diminution of size in the right mamma was in a short time apparent; and during an attack of fever, which she had about six months after her discharge from the Infirmary, the diminution became considerable.

She is now a healthy young woman, and at the time of writing this, twenty-three years of age. The right breast is still larger than is natural; but it is not half so large as it was before the amputation of the left breast. The integuments covering the right breast are in a loose flabby state, and the breast itself does not feel like one compact gland, but, as was mentioned before, like a number of glands connected. A curvature in the spine still continues; but she is become straighter than she was before the operation.

CHAPTER XVII.

OF COLLECTIONS OF PUS IN THE VAGINA.

CASE I.

IN April, 1780, Mrs. D. of S. about twenty miles from Leeds, consulted me on account of a very troublesome *fluor albus*, as she judged it to be. She informed me, that the disorder had come upon her about five years before, during pregnancy, and had hitherto resisted the effect of every remedy given for her relief. In answer to my inquiries she gave me the following account of her complaint.

The colour of the discharge was white, inclining to yellow. It flowed in an irregular manner, unconnected with any circumstance which she could recollect. Sometimes the discharge ceased entirely. Sometimes it began to flow suddenly in large quantity, and continued diminishing until it ceased. The parts were often rendered sore by the evacuation.

From these circumstances I suspected, that the nature of the complaint had been mistaken; and was apprehensive that a collection of purulent matter might have been formed in the vagina. I gave her the reasons of my suspicion; and told her, that, in my opinion, the true state of her case could not be ascertained without an examination of the part affected.

Upon examination my suspicions were verified. I found a quantity of purulent matter collected on the left side,

where the labium pudendi joins the vagina. I thrust the blunt end of a probe into the cyst, where it appeared to be very thin, and the matter flowed out copiously. I informed her, that a surgical operation would be necessary for her cure; but she declined submitting to it, and returned home.

I heard no more of my patient till May 1781, when she returned to Leeds, determined to put herself under my care. The disorder had remained in the same state. The cyst was sometimes healed; and then, bursting open, continued for a time to discharge the purulent matter, as before.

Upon dividing the cyst, I found that the cavity in which the matter lodged, was about an inch and half in diameter. The whole interior surface of the cyst was smooth and shining; and on that account I judged it improbable that a simple division of the cyst would effect a cure. I thought it necessary, therefore, to remove the greater part of that portion of the cyst which was formed by the internal lining or cuticle of the labium pudendi. The hæmorrhage was inconsiderable, and soon ceased. The wound healed kindly, and my patient obtained a perfect cure.

CASE II.

In 1786, Anne Miller came under my care as an out-patient of the General Infirmary at Leeds, for a node upon the tibia, which I suspected to have had a venereal origin. When she was about to be discharged cured, she informed me, that she had been troubled for fifteen or sixteen years with sudden and irregular discharges of purulent matter from the vagina. These discharges, she said, were frequent, and sometimes considerable; yet she never perceived any matter to be mixed with her urine.

Upon examination I found a roundish tumour at the os externum, appearing to be formed by an enlargement of the bulbous part of the urethra. When the tumour was

compressed, pure pus issued from the urethra; yet her urine, when drawn off with a catheter, did not contain the least mixture of purulent matter. Upon introducing a bent probe into the urethra, I could easily push it to the most depending part of the tumour; and could feel the probe distinctly by a finger introduced within the vagina.

I divided the tumour longitudinally, at a time when it was distended with matter. That part of the vagina which I cut through was not thinned by the distention, but was rather tough. The cavity of the cyst was smooth. As the opening which I had made was depending, and as the removal of any part of the cyst would have been attended with difficulty, I only filled the cavity with lint. A small artery was opened by dividing the cyst, but the hæmorrhage did not continue long. This patient recovered speedily, and got quite free from the complaint.

CHAPTER XVIII.

ON ALVINE CONCRETIONS.

So many histories have been published of Alvine Concretions, which had acquired a form somewhat globular, generally containing a nucleus of some hard and indigestible substance, as the stones of fruits, &c. that it may seem unnecessary to relate more instances of this disease.

Yet, as this work may fall into the hands of some persons, who have not read the histories to which I allude; and as the public can scarcely be too often reminded of

the impropriety of swallowing the stones of plums or cherries, which young people especially are apt to do in eating those fruits; I shall give one instance of the dangerous, and another of the fatal effect of these concretions.

CASE I.

I was desired some years ago to visit a young woman, who complained of great pain in the hypogastrium, and at the anus, attended with difficulty of discharging her fæces. The pressure which she felt occasionally at the anus was so great, that I judged it necessary to examine that part, and found a hard substance pressing against the sphincter ani, which she could not expel by the natural efforts.

I extracted this substance by means of a pair of forceps used in lithotomy, and found it to be a ball of light friable matter, containing a rough plum-stone in its centre. After this was removed, two other concretions of the same nature presented themselves, and were extracted in succession by the same instrument. They had each of them a plum-stone for a nucleus.

Upon inquiry into the origin of this young woman's complaint, there seemed no reason to doubt, that these stones had remained six years in the alimentary canal. The young woman recollected having paid a visit to an uncle, who was a grocer at Wakefield, and who had permitted her to eat freely of prunes in his shop. She remembered also having frequently swallowed the stones of the prunes which she then ate. But six years had now elapsed since this visit; and she was positive, that she had not eaten a prune since that time.

These concretions may grow to such a bulk, that they cannot pass into the rectum, and of consequence must prove fatal to the patient as in the following case.

CASE II.

I was permitted to examine the body of a boy, whose parents lived at Holbeck, near Leeds, and who had died in an emaciated state, having had long continued pain in the abdomen, attended with frequent attacks of the ileus.

I found a concretion, of the kind above mentioned, lying in the transverse arch of the colon, which was become of so great bulk, that it could pass no farther along the course of the intestine. This seemed to have been the sole cause of the boy's death.

Mr. White, of Manchester, has published some useful cases of this disease, and has also given references to other authors, who have treated on the same subject.*

An instructive paper, written by the late Dr. Fothergill, was published by the *Medical Society* in the third vol. of *Medical Observations and Inquiries*, p. 123, on the collection of indurated fæces in the rectum, which I would recommend to the perusal of the young practitioner, as the disease does not very frequently occur, and as it appears under a form so fallacious, that a person, who is not attentive to every symptom, may readily be misled.

My principal design in taking notice of this disease was, to relate a case, which, whether we regard the history of the symptoms, or the method of cure, will not, I hope, be thought uninteresting.

CASE III.

Mrs. S. was delivered of her third child, January 31st, 1799. She had not complained of any unusual consti-

* See Cases in Surgery, by Charles White, F. R. S. p. 17.

ness; nor, indeed, had she made any complaints to me during the last month of her pregnancy.

She had natural evacuations during the first week of her confinement, and took no medicine except one anodyne draught. At the expiration of the first week, she began to complain of a painful motion to make water. This complaint was relieved by giving her (Feb. 9th.) a solution of the bitter purging salt, and an oily emulsion. She took no medicines from this time till the 21st, three weeks after her delivery, when she took a purging draught, and some more of the emulsion. She was not now confined to her room, nor even to the house; but sometimes walked out into the garden.

In the last week of February the complaint became more troublesome and constant. She had frequent pains, exactly resembling those of labour, attended with a considerable degree of pressure downwards. Purging draughts, laxative clysters, together with the oily emulsion, and occasionally an anodyne at bed-time, afforded her some relief. Her pulse, however, became more frequent, and a degree of fever remained constantly upon her.

During the month of March she was chiefly confined to her chamber, as walking seemed to increase the pressure downwards. She took the simple saline draughts, and sometimes an opening draught; but the evacuation of the *fæces* was principally assisted by the injection of mild clysters. In the last week of this month, the nurse found the clysters did not pass into the intestines as usual, but returned immediately. A solution of the bitter purging salt, was, therefore, given more freely, but it did not answer as usual; and before the termination of the week, a complete obstruction in the alimentary canal took place. She now began to reject by vomiting what was taken into the stomach; and there was an evident fulness in the abdomen, particularly in the hypogastrium, which had not before been perceived.

As the nurse had failed in her attempts to inject the clysters as usual, and as purgatives taken by the mouth

were now rejected, it became necessary to make the strictest inquiry into the cause of this obstruction. I attempted to give my patient a clyster, but found the same difficulty of which the nurse had complained. The pipe passed readily into the rectum, and was not blocked up by fæces; yet the clyster returned immediately, without passing into the colon, whatever force was used in the injection.

Upon introducing my finger into the rectum, I found it empty; but its highest part was closed, being pressed against the os sacrum by a hard substance, which occupied the superior part of the pelvis. This substance felt like an enlarged uterus; enlarged, I mean, when considered in its unimpregnated state. I made an examination also per vaginam, and was still led to think, that the uterus was pressed against the os sacrum.

At this period of the disease Dr. Davison was consulted, who continued to attend with me during the remainder of our patient's indisposition. We gave various purgatives, as *ol. ricini*, jalap alone, or with the addition of calomel, in the form of pills, magnesia, with lemon juice taken immediately after it. These medicines sometimes remained for a few hours upon the stomach, but were always sooner or later rejected. A warm *femicupium* was used, which afforded some relief from pain, but did not procure an evacuation of the fæces.

Our patient was now reduced to a state of extreme danger. Purgings afforded no relief, and clysters injected into the rectum could not be made to pass the stricture at the brim of the pelvis. In this dilemma it occurred to me, that if I could make a long flexible catheter pass beyond the compressed part of the rectum, I should be enabled to inject a clyster through it into the sigmoid flexure of the colon, and thereby probably bring down the obstructed fæces. To effect this purpose, I introduced the fore-finger of my right hand as high in the rectum as possible, and with this finger directed the catheter to that part where there seemed to be the least resistance. I then pushed on the catheter with my left

hand, and with my finger which was in the rectum. By this method, though not without difficulty, I made the instrument pass into the sigmoid flexure of the colon, into which I now injected a large clyster. When the catheter was withdrawn, its extremity appeared to have passed into some indurated fæces; which circumstance not only threw light upon the nature of the disease, but also afforded us strong hopes of being able to subdue it. An evacuation of fæces was procured, and the vomiting ceased.

The clysters were repeated, by the method above mentioned, morning and evening, so long as they appeared to be necessary. They were generally made with a pint of water-gruel, and an equal quantity of olive-oil, mixed by means of the yolk of an egg. The fæces were sometimes discharged in hard lumps, but they had generally the appearance of bran, as if they had become dry by their long residence in the intestine, and had afterwards become mixed with the more liquid excretion of the intestines, or with the clyster. This kind of excrement continued to come away during the course of a fortnight.

In the second week of April a spontaneous diarrhœa took place, and our patient became very feeble. She had now and then a retching, which seemed to arise from mere debility of the stomach. Anodynes, with tonic and cordial medicines, were now given. Wine, or a little brandy, was put into her gruels, which were made with sago, tapioca, salop, and the like.

Mrs. S. had at this time a cough, which was troublesome. The matter expectorated was mucous, and we hoped that it arose merely from too copious a secretion of that fluid, without any serious affection of the lungs.

Though the original disorder had been completely removed, the secondary complaints which supervened, attended with general debility, brought our patient again into imminent danger. Though the diarrhœa was in a considerable degree restrained, yet she became more and more emaciated, and that to a very high degree. The quantity

of food which she took was small, and her digestion seemed languid.

In this state, April 28th, Dr. Davison proposed the application of a blister to her stomach, with the view of rousing the action of that important organ, and affording a general stimulus to the habit. This seemed to have a good effect. We found her not quite so low the next day. From that time she continued to recover, though slowly, and at last regained perfect health.

CHAPTER XIX.

ON THE ATHEROMA.

THE Atheroma is an encysted tumour, containing a substance, resembling soft curds.* It is situated immediately under the cutis; and the attachment of its cyst to the circumjacent adipose membrane is generally slight. It frequently attacks the face in children, forming tumours about the size of a pea, which are smooth, and appear rather whiter than the rest of the skin. These after some time become inflamed, and burst. Their contents are then discharged, and the part heals without any inconvenience. From this spontaneous termination of the complaint, these tumours are usually left to take their course, and are considered as

* *Αθήρωμα* est tumor concolor, doloris expers, in quo aliquid pul-
culæ, quæ *αθήρη* vocatur, simile, tunicâ quâdam membranôsâ conclu-
ditur. Goræi *Definitiones Medicæ*, p. 8.

of little consequence. When, however, they are situated on the eyelids, (which they often attack), and particularly near the eye-lashes, they sometimes, during their inflamed state, produce a troublesome ophthalmy, which I have seen terminate in an opacity of the cornea. It is of consequence, therefore, to know the proper treatment of this complaint, and the following description of an easy method of cure may not be unacceptable to the young practitioner.

If the eyelid is the part affected, I make an incision across the tumour in the course of the fibres of the orbicular muscle; and, after pressing out the contents, I pull out the cyst with a pair of dissecting forceps. It is often difficult to distinguish the cyst from the cutis, when the tumours are small; but by pressing the points of the forceps against the sides of the cavity, whence the curdy matter issues, one may soon lay hold of some part of the cyst. Its attachment to the surrounding cutis and membrana adiposa is so slight, that it is drawn out without difficulty. It is sometimes broken in the extraction; but one may readily discern whether any part of it remains unremoved by the following criterion. So long as any fragment is left, the appearance of tumour continues; whereas when the whole is extracted, the tumefaction vanishes entirely. No other dressing is necessary in this case than a little emplastrum lithargyri.

If this operation is delayed till the cyst has burst, and the tumour, being large, has remained in a state of inflammation for a week or two, a fungous will sometimes be found within the tumour, which may require the application of the lunar (or some other) caustic.

Atheromatous tumours are often found upon the head of adults. I have seen the scalp almost covered with them. The cyst, in this situation of the tumours, becomes firm, resembling a bladder in texture and thickness. If the tumour is not large, the cyst may be removed whole, by laying hold of it with a hook, after making a crucial incision through the skin, and separating it from the upper part of the cyst.

When these tumours are situated on the eyelids, they ought to be removed before they become inflamed, if an opportunity of doing this is afforded: but a state of inflammation should not be considered as an impediment to the operation, especially if the conjunctiva partakes of that state. I have seen a dangerous ophthalmia subside immediately, upon the removal of the cyst of an inflamed atheroma, situated upon the edge of the eyelid.

CHAPTER XX.

ON DEEP-SEATED ABSCESSSES IN THE MAMMA.

THE abscess, which I mean to describe, does not frequently occur, yet it is not confined to women in the puerperal state, nor to those who give suck. I have seen it repeatedly in unmarried women. It does not differ in its original formation from a common abscess; but its situation renders all superficial applications ineffectual, and requires a more severe method of cure, than that which is usually sufficient in the common milk abscess. The inflammatory stage is tedious; and, when the purulent matter has burst through the integuments, the discharge continues without any apparent tendency to healing. Sometimes the matter bursts out at different places, and the intermediate parts of the breast feel hard, as if affected with schirrus. Sometimes the matter lodges behind the mamma, as well as in the substance of that gland. The cavities formed by the matter are often numerous, running

in a variety of directions, and, when opened, are found to be in part filled with a soft fungous of a purple colour.

This disease will sometimes continue for many months with little variation in its appearance. A degree of hectic fever, however, is kept up by the absorption of the confined matter; and the breast usually becomes more indurated in proportion to the continuance of the complaint. I have not hitherto met with any case, which has not been cured without extirpation of the breast. The following treatment has always proved successful, and has sometimes effected a cure in less time than the extent of the wounds led me to expect.

Having examined the course of that sinus, out of which the matter issues, I divide it throughout, however deep its situation in the breast may be. I then examine carefully with my finger the whole extent of the wound, that I may discover the orifices of any other sinuses connected with it. These, it is necessary to observe, cannot always be discerned with the eye, as they are sometimes filled up with the soft fungous above mentioned, and present no visible cavity. By pressing the finger upon any part that feels softer than the rest of the wound, one may easily break down the fungous, and thereby discover the orifice of any collateral sinus. All the sinuses must be opened through their whole extent, however numerous, or tortuous in their course. Unless this be done, the operation proves fruitless. If, in doing this, I find any two sinuses running in such directions, that, when fully opened, they leave a small part of the mamma in a pendulous state, I remove that part entirely. I have been under the necessity in this operation of making so many incisions through the breast, that it has been divided into several pieces, yet the wounds have healed favourably, and the breast has ultimately preserved its natural figure. This operation has succeeded in habits which would be judged unfavourable to the healing of any wound, as in the following

CASE.

Martha Wilson, of Pontefract, was admitted an in-patient of the General Infirmary, on account of scrofulous ulcers. I scarcely ever saw them so numerous in any one person. The anterior part of the thorax, the clavicle, the shoulder, and axilla on the left side, were almost covered with them. After having obtained considerable relief by the use of the lotion mentioned below,* by which most of the superficial ulcers were healed, (the incrustations, which covered them at her admission, being removed by a digestive ointment), she was made an out-patient. While she remained at home, a deep-seated abscess was formed in, and behind the mamma. After this had continued some months she was again taken into the house. The matter had burst through the integuments just above the mamma. A probe, introduced at this orifice, passed down behind the breast, till it might be felt through the integuments below. I made a complete division of the breast, and also opened three lateral sinuses, which communicated with the longitudinal one, but were not of great extent. Notwithstanding the habit of this patient, the wounds healed so speedily, that an union of the divided parts was formed in the course of a fortnight, and the wounds were cicatrized in a short time afterwards. The proper form of the mamma was preserved.

* R. Aquæ puræ, ℥xxx:
 Spt. Rorismarin. ℥ij.
 - - - Lavendul. comp. ℥ij.
 Zinci vitriolati, ʒj.
 misce fiat. lotio.

The ulcers were kept continually moistened with this lotion, by the application of folded linen cloths previously soaked in it.

CHAPTER XXI.



ON AMPUTATION.

DISEASES which require the amputation of a limb, or some part of the extremities, so frequently occur, that every improvement of this operation must be considered as important in the practice of surgery. The method of amputating so as to heal the wound by the first intention, as it is called, I consider as a capital improvement; and I am sorry that it is not yet universally adopted. If I were not aware of the force of prejudice, I should be ready to conclude, that a surgeon was defective either in knowledge or humanity, who did not prefer this method, whenever it was in his power to make use of it.

A cure is performed by it in one fourth part of the time which is required when the ordinary mode of dressing is used. The pain subsequent to the operation, which is great and long continued when the interior parts of the wound are dressed, is hereby avoided in a great measure; and the cicatrix, which must remain in some degree after the wound is healed, being reduced to a very small breadth, is not so liable to break open again from accidental injuries. This method of operating, when rightly understood, is not peculiarly difficult; but the comparative relief which the patient receives from it is great indeed.

1. *Amputation in the Thigh or Arm.*

When a flap is not made, which is usually unnecessary when amputation is performed in the thigh or arm, nothing

more is necessary than to amputate with a triple incision, and to preserve such a quantity of muscular flesh and integuments, as are proportionate to the diameter of the limb. By a *triple* incision I mean, first, an incision through the integuments alone; secondly, an incision through all the muscles made somewhat higher than that through the integuments; and thirdly, another incision through that part of the muscular flesh which adheres to the bone, made round that part of the bone where the saw is to be applied. When these incisions are made in their proper places, the integuments and muscles on the opposite sides of the stump will meet each other conveniently, and may be preserved in contact so as to produce a speedy healing of the wound, and a convenient covering for the extremity of the bone.

The proper distances of these incisions from each other must be determined by the thickness of the limb, upon which the operation is to be performed, making allowance for the retraction of the integuments, and of those muscles which are not attached to the bone.

I will suppose the operation to be performed upon the thigh, and the circumference of the limb to be twelve inches, at that part where the division of the bone is intended to be made. The diameter of the limb, in this case, being four inches, if no retraction of the integuments were to take place, a sufficient covering of the stump would be afforded by making the first incision at the distance of two inches from the place where the bone is to be sawed, that is, at the distance of the semi-diameter of the limb on each side. But as the integuments, when in a sound state, always recede after they are divided, it is useful to make some allowance for this recession; and to make the first incision half an inch below the semi-diameter of the limb.

Supposing the thickness of the integuments to be half an inch, the diameter of the limb after the first incision would be reduced to three inches; the second incision might, therefore, be made at the distance of an inch and half below the place where the bone is to be divided: but it is useful to make some allowance for the retraction of the

muscles, particularly the posterior muscles of the thigh, which takes place in them to a considerable degree in the process of healing. These should be divided somewhat lower than the rest of the muscles, if it is wished that the muscular flesh should retract equally on all sides of the stump. The division of the posterior muscles may be begun at half an inch, and that of the anterior at three quarters, above the place where the integuments were divided. The integuments will retract a little both above and below the place where they were divided; but the distance from that place must be computed from the mark left upon the surface of the muscles in dividing the integuments. The edge of the knife should be directed somewhat obliquely upwards in dividing the muscles, and the division should be made through the posterior muscles at one stroke, and through the anterior at another.

In order to make the third incision, the divided integuments and muscles must be drawn upwards by an assistant, who will generally do this the most conveniently with the aid of a retractor, and who should be cautious to avoid pulling the periosteum from the bone, when the muscles which adhere to it are divided.

The most perfect union of the soft parts would be produced by making an incision through them all in a conical direction; the apex of the cone being that part of the bone where the saw is to be applied. But such an incision is impracticable in the ordinary mode of operating; nor is it necessary for the formation of a good stump.*

As it is desirable that the ligatures, by which the bleeding vessels are secured, should be cast off in the course of ten or twelve days, it is the best method to draw out the ex-

* It is evident, that a conical incision through the muscles of the thigh cannot be made with a continued stroke, in the usual mode of amputating. For supposing the edge of the knife to have once penetrated obliquely through the muscles, so as to be an inch higher when arrived at the bone, than when it penetrated the surface; if the incision be continued with a flowing stroke, the knife must then cut the surface of the undivided muscles an inch higher than at the commencement of the incision.

tremitity of each vessel with a tenaculum, for the purpose of applying a ligature. But the situation of an artery is often such, that it becomes necessary to make use of a needle. In this case, the needle should be made to pass as near the vessel as possible. I have been accustomed to tie the femoral artery twice, leaving a small space between the ligatures; and this method has been constantly used in the Leeds Infirmary since its establishment. Having seen a few instances of bleeding from the femoral vein, I generally inclose the vein in the ligature along with the artery.

I have seen a few instances of the integuments becoming so contracted after the operation, as to compress the veins just above the extremity of the stump, and bring on after some hours a copious hæmorrhage. When it has appeared clear to me that the hæmorrhage was venous, I have made a division of the integuments on one side of the thigh, sufficient to remove the stricture, and this method has immediately suppressed the hæmorrhage. Should the integuments, after amputation, shew such a disposition to contract, as to threaten a strangulation of the stump, (a case which I have seen), it is then prudent to make a longitudinal division on one side of the stump before the dressings are applied, and to continue it so high as to remove all appearance of undue contraction.

Sometimes the integuments of the thigh are in a morbid state on one side of the limb, while they are sound on the other. In this case, a longer portion of integuments and muscular flesh must be left on the sound side, which will not prevent the formation of a good stump. The morbid state of the anterior or posterior side of the thigh sometimes extends so far above the knee, that it is advisable to amputate with a flap. I have several times, indeed, made a flap on the anterior part of the thigh by choice, though I do not usually operate in this way, as it unnecessarily shortens the remaining part of the limb. I have never, but from necessity, made a flap on the posterior side of the

thigh, yet this may be done in certain cases with great advantage.

A brother of the ingenious Mr. Mann, of Bradford, near Leeds, the inventor of the new artificial wooden leg, had an enlargement of the inferior and anterior part of the thigh-bone, which required the amputation of the limb. The posterior part of the thigh being in a perfectly sound state, I made a flap of the integuments and muscles on that side, and by this method was enabled to saw off the bone immediately above the tumour, which in this case was a great advantage. The tumour, upon dissection, was found to be principally cartilaginous, though the process of ossification had begun in it, and seemed to be advancing from the thigh-bone towards its exterior parts. The necessities of a near relation urged both the father and brother of this patient to contrive an excellent succedaneum. The contrivance of the brother being judged to have superior excellence, a patent was obtained for the invention, which has added much comfort to the lives of many who have had the misfortune to require amputation above or below the knee.

In scrofulous white swellings of the knee, the *sacculus mucosus*, which lies behind the tendon of the rectus femoris, is sometimes in a morbid state, distended with a glairy purulent fluid, and extending so high above the knee, that it would be inconvenient to make the incision through the muscles above the tumour. In this case, a surgeon is not under the necessity of amputating with a flap made on the posterior part of the thigh, if he dislikes this mode of operating: but he should dissect out that part of the morbid sac which remains above the place where the muscles are divided. This operation is practicable; and I have always judged it to be prudent, lest the remains of so morbid a part should give rise to some fresh disease in the stump.

When the limb is amputated, the integuments and muscles may be brought into contact by pressing either the anterior and posterior parts, or the sides of the thigh, to-

gether. The former method, by the gradual retraction of the posterior muscles, causes the integuments of the anterior part of the stump to cover more completely the extremity of the bone. The latter method causes the integuments and muscles to meet each other the more readily, and therefore is to be preferred when the quantity of soft parts preserved is somewhat deficient.

The integuments are most conveniently held in contact by sutures, for the making of which, straight needles should always be used. But an union of the parts may be produced without sutures, by keeping them in exact contact with the assistance of plasters. Both these methods of dressing have their advantages and disadvantages, and my opinion has fluctuated respecting their superiority. Plasters give less pain in their application, and are more easily removed and renewed when a subsequent hæmorrhage requires the stump to be opened: but they confine the purulent matter more within the wound, and thereby delay the cure; and sometimes cause pain from the confinement of the matter. Sutures give more pain in the application, and that sometimes in a considerable degree; but then, if the amputation has been properly conducted, no tight pressure of plaster, nor strict bandage, is required to keep the integuments in contact; a long pledget of cerate, with a flannel roller, being all the dressing required, till the ligatures of the integuments are removed. The purulent matter escapes more readily through the apertures in which the ligatures of the vessels lie, and the cure is generally more speedily accomplished. Either method may be used after amputation made upon the thigh, with the triple incision; but when a flap is made in the leg, sutures are preferable, for a reason which I shall mention.

When sutures are used, the straight needles should be pushed obliquely through the integuments, for the purpose of bringing them more exactly into contact.

After the first two days, the pledget and bandage may be renewed every day; and as soon as the ligatures which

united the integuments become loose, they should be cut out, and the parts should be supported by plasters.

It is no sufficient objection, to the method of healing a stump by bringing the divided parts into contact without the intervention of any other extraneous substance except the ligatures which have been applied to the arteries, that a hæmorrhage may take place several days after the operation, and even when the integuments are united. This is a rare occurrence, though I have known it to happen. However, I know that the separation of the integuments by a scalpel, in this case, gives very little pain to the patient; and the possibility of such an occurrence is not to be set in competition with the advantages of this method of conducting amputation.

When we are under the necessity of amputating a limb that has suffered great contusion, though the operation is performed upon a part apparently sound, the wound sometimes becomes sloughy, and ill-conditioned. No good granulations arise to cover the extremities of the arteries; but the ligatures cut through these vessels, or becoming loose, cease to make a sufficient pressure upon them, and hence repeated hæmorrhages ensue. This is a dangerous state for a patient; for if the vessels are taken up afresh with the needle, the hæmorrhage will now and then return in the course of two or three days. In such cases the application of dry sponge, cut transversely, as directed by Mr. White,* has been found singularly useful, and has saved the life of the patient. But a constant pressure must be kept upon the pieces of sponge, by the fingers of a succession of assistants, till granulations begin to arise upon the stump, and the prospect of future hæmorrhage disappear. This method is of the greatest importance after amputation on the thigh or leg, where the great vessels are deeply seated. In the arm, above the elbow, where the vessels are more superficial, the great artery may be taken up, with a portion of muscular flesh, above the

* See Cases in Surgery, by Charles White, F. R. S.

surface of the stump, by making first an incision through the integuments. My colleague Mr. Logan has done this twice within the last year, with complete success, when repeated ligatures, applied in the usual way, had failed.

In the morbid sloughy state of the stump above mentioned, the application of lint soaked in a liquid, composed of equal quantities of lemon juice and rectified spirit of wine, has been found very advantageous, and has caused the stump to put on soon a healthy aspect.

2. *Amputation below the Knee.*

Amputation below the knee, when a flap is preserved, has been usually performed at as small a distance above the ankle as is necessary for the formation of a flap; but I am satisfied from much experience, that this is not the most proper place for amputation.

Soon after Mr. White had published his account of amputating with a flap, as recommended by Mr. O'Halloran, of Limerick, I went over to Manchester to see the effect of this operation. It appeared to me to be a considerable improvement in surgery; though, from the manner in which Mr. White then made the flap, this did not completely cover the extremity of the stump. I determined, however, to introduce this method of amputating into the Infirmary at Leeds; but before an opportunity offered, I was informed of an improvement which Mr. Bromfeild had made upon Mr. White's operation.* Mr. Bromfeild's manner of making the flap seemed superior to that of Mr. White; but I approved of the double incision which Mr. White had used in some of his cases. I resolved therefore to combine the improvements of these two eminent surgeons, by making the flap in the manner recommended by Mr. B. at the same time preserving, by the

* Mr. Bromfeild afterwards published this method.

double incision, a portion of integuments, on the anterior part of the leg, sufficient to cover completely the edge of the tibia.

I operated for the first time after this manner March 1st, 1772; and, as Mr. Lucas has observed, who sent an account of this and some other cases to the Medical Society in London, "no opportunity has been omitted in giving the preference to this mode of amputating since it was first done.*" After Mr. Alanson, and the other surgeons at the Liverpool Hospital, had made a farther improvement of this operation, by applying the flap immediately after amputation, we adopted their method in preference to that, recommended by Mr. White, of dressing the flap and stump separately till the ligatures had fallen off.

In 1774, I operated upon James Pilkington,† in whose case I was under the necessity of amputating at the lower part of the belly of the gastrocnemius muscle. I applied the flap by degrees, and made a good covering for the stump. I continued, however, to amputate in general a little above the ankle for many years. But some cases occurring, in which, from a scrofulous habit, the wound would not heal completely, or remain healed, so that the patient could neither bear the pressure of a socket, nor conveniently use a common wooden leg (as the length of the limb projecting backwards exposed the stump to frequent injuries); I determined to try whether amputation in a more muscular part of the leg would not secure a complete healing, and give the patient an opportunity of resting his knee on the common wooden leg, or using a socket, as he might find most convenient. I now prefer this method, and have reduced it to certain measures, the recital of which will best convey my ideas, and assist those who wish to adopt this mode of amputation.

It had been the general practice at the Leeds Infirmary, to make the length of the flap equal to one-third of the

* Medical Observations and Inquiries, vol. 5 p. 327.

† *Ibid.*



circumference of the leg, at that part where the amputation was made. But we used no measure for the breadth of the flap. This was determined by the eye of the operator, who usually pushed the catlin through the leg, near the posterior part of the fibula. Finding that I did not always make the flap of the most convenient breadth, I began to ascertain this also by measure, and now always operate in the following manner.

To ascertain with precision the place where the bones of the leg are to be divided with the saw, together with the length and breadth of the flap, I draw upon the limb five lines, three of them circular, and two longitudinal. The situation of these lines is determined in the following manner. I first measure the length of the leg from the knee to the ankle; that is, from the highest part of the tibia to the middle of the inferior protuberance of the fibula. At the midway between these two joints I make the first, or highest, circular mark upon the leg.* This mark is to point out the place where the bones are to be sawn through. At this mark also I measure the circumference of the leg, and thence determine the length and breadth of the flap, each of which is to be equal to one-third of the circumference. In measuring the circumference of the limb, I make use of a piece of marked tape or ribbon,† and place the extremity of this measure upon the anterior edge of the tibia. I will suppose the circumference to be twelve inches, in which case I make a dot in the circular mark on each side of the leg at the distance of four inches from the anterior edge of the tibia. It is evident that these dots will be found four inches distant from each other, when the measure is applied to the posterior part of the leg. From each of these dots I draw a straight line downwards, four inches

* Plate 9. fig. 1. a a.

N. B. The *continued* lines in this figure mark the place and extent of the incisions. At the place of the *dotted* lines there is no external incision.

† Such as are sold in the shops in small ivory cases.

in length, and parallel to the anterior edge of the tibia.* These lines mark the course which the catlin is to take in the formation of the flap. At the extremity of these lines I make a second circular mark upon the leg, which points out the place where the flap is to terminate.† Lastly, I make a third circular mark, at the distance of an inch below the superior one which was first made,‡ which intermediate mark is designed to direct the circular incision through the integuments on the anterior part of the limb. The course and extent of the different incisions being thus marked out, the operation may be performed with the greatest precision.

The catlin, which is used for the purpose of making the flap, ought to be longer than those which are commonly made for a case of amputating instruments. That which we use at the Leeds Infirmary is seven inches long in its blade. I prefer a catlin which is blunt at the back, as I wish to avoid making any longitudinal wound in the arteries at the extremity of the stump, for such a wound makes it more difficult to secure them with a ligature. For the same reason, I push the catlin through the leg, a little below the place where the transverse incision is to be made of those muscles which are not included in the flap. Having placed the limb in a position nearly horizontal, with the fibula upwards, and the knee bent, I push the catlin through the leg at *d*, and carry it downwards, along the course of the longitudinal marks, till it approaches the lowest circular mark, which it joins in the course of the curved line, and the incision then terminates a little below the inferior circular line *e c*.

The flap being held back by an assistant, I divide the integuments on the anterior part of the limb along the course of the circular mark *b d*. There is always a considerable retraction of the skin after it is divided, if the

* Plate 9. fig. 1. *d*. † *Ib. e e*.—The incision is usually carried to a small distance below the inferior circular mark, to allow for the retraction of the skin, which is the greatest at its extremity, and to preserve a circular border in the flap; but the distance represented in the plate is too great.

‡ *Ib. b c*.

integuments are in a sound state; and if a proper allowance were not made for this retraction, the extremity of the tibia would be left uncovered, and the flap could not be applied with so much ease to the patient, nor with a certainty of an union by the adhesive process.

The muscles, which are not included in the flap, are then divided transversely a little below the place where the bones are to be sawn through; but no great quantity of muscular flesh can be conveniently preserved below the extremity of the divided bones, (on account of the adhesion of the muscles to the bones), nor is it necessary, as the flap, when made in the middle of the leg, contains a portion of the gastrocnemius and solæus muscles, sufficient to make a good cushion for the extremity of the bones.

When the bones are sawn through, it is advisable to cut off a little of the extremity of the conjoined flat tendon of the gastrocnemius and solæus muscles, as it is apt to project beyond the skin when the flap is placed in its proper situation.

The large crural nerve is frequently found lying upon the inner surface of the flap. It should then always be dissected out, and, when gently extended, should be divided near the extremity of the stump. By this method it will retire so far as to suffer no compression from the flap.

I have repeatedly supported the flap by plasters, without making use of a needle. But although futures are undoubtedly a painful part of the operation, yet, upon the whole, I think they contribute to the ease of the patient, when amputation is performed below the knee with a flap; for the flap cannot be kept in exact contact with the surrounding integuments by means of plasters only, without making a considerable pressure upon the end of the bones. And as the surface of bone, against which the muscular part of the flap must be pressed, is here considerable; the flap is apt to become inflamed by the pressure, and to give the patient more pain than when it is united to the integuments

by futures, which keep the flap in such exact contact with the divided muscles and integuments, that there is no occasion for strong pressure upon it. It is sufficient to apply small strips of court plaster between the ligatures, to prevent the integuments from receding at those places, and to support the flap with a long pledget of tow spread with cerate, which is secured by the flannel roller applied to the limb.

The ligatures, which unite the flap to the surrounding integuments, may be cut out on the eighth or ninth day after the operation, and the flap must then be supported by plasters.

I shewed Mr. Mann, of Bradford, a stump, made by amputating in the manner here directed, and he assured me that it was exactly of the length most suitable for the application of his artificial leg. Indeed, the advantages of a stump made according to the above rules, must strike every one, upon the first view, who is at all acquainted with the subject. Mr. Mann advises all persons, who wish to avail themselves of his invention, to keep a roller constantly applied to the leg or thigh after amputation, as without this previous pressure the limb is apt to shrink, and become somewhat loose in the socket of his wooden legs.*

3. *Excision of the Metatarsal Bones.*

The metatarsal bones are sometimes affected with caries, while every other part of the leg remains sound. In this case, the removal of the diseased parts may be effected without amputation of the whole foot. The remainder of the foot, with the assistance of the ankle-joint, proves of great use to the patient in walking. When the caries has been confined to the metatarsal bone of the great toe,

* I lately saw with pleasure a curious arm, the invention of this ingenious mechanic, perfectly resembling a natural arm, and so contrived, that by a gentle pressure of it against the side of the patient, the fingers are made to contract, and lay hold of any substance, which the person may wish to grasp.

it has been usual, I believe, after making a longitudinal and transverse incision, to saw off that part of the bone which has been found carious. This, however, cannot well be effected without removing a part of the integuments and muscles which cover the metatarsal bone. I have found it to be a more convenient and advantageous method of operating, to dissect out the whole of the metatarsal bone, at its junction with the cuneiform bone. A transverse incision is not required in this method; and as it is not necessary to remove any part of the integuments, the wound is more speedily healed, and the cicatrix is greatly diminished.

The operation is more difficult when the metatarsal bones in the middle of the foot are the seat of the disease. I have never yet attempted to take out a single metatarsal bone from the middle of the foot; partly, from an apprehended difficulty of taking up the bleeding vessels, in a wound so straitened by the contiguous bones of the metatarsus; but chiefly, from an uncertainty respecting the extent of the disease. When the smaller metatarsal bones have been the seat of the disease, I have found the integuments on the upper part of the foot in so morbid a state, that I could not determine, with satisfaction to myself, whether one or more of these bones had been rendered carious. Where only one sinus has been formed upon the foot, and that leading to a certain bone; yet the disease has affected the integuments to such an extent, that it has seemed to me imprudent to leave so much morbid integuments, as would have been left if one bone only had been dissected out. Urged by these considerations I have judged it to be the safer method (and in this opinion and practice my colleagues at the Leeds Infirmary have joined me) to take away all the diseased integuments, by a transverse and longitudinal incision, made at right angles to each other, and then to saw off the metatarsal bones as far as the morbid integuments extended. After an operation of this kind, the extent of the sore is considerable; and as no sound integuments remain projecting, so as to form a covering, the cure has always been very tedious, and the cicatrix

extensive. I was once obliged, in this mode of operating, to remove all the toes, except the least, together with a large portion of their metatarsal bones. The wound was five months in healing, and broke out again in the course of a year after the patient was dismissed from the Infirmary cured. She was a young woman, and in other respects healthy, yet a cicatrix was not completely formed, upon her return to the Infirmary, till several months were elapsed. This operation is greatly superior to that of amputating the leg; for she was able, when cured, to walk with very little limping. However, the tediousness of the cure, and the tendency of so large a cicatrix, on the extreme part of the body, to degenerate into a fresh sore, afford some objection to this method of operating.

In the year 1797, a case occurred that led me to a new mode of operating, which, upon repeated trial, has fully answered my expectations.

CASE I.

Mary Sedgwick, of Otley, aged eighteen years, was brought to the Leeds Infirmary, on account of an ulcer on the upper part of the foot, at the root of the first and second toes. Upon examination I found the metatarsal bones carious. The integuments at the root of the third toe being hard and discoloured, I determined to remove the three first metatarsal bones, and so much of the smaller bones of the tarsus as were covered with diseased integuments. My design was to have performed the operation in the manner above described; but upon sawing the metatarsal bones, they were found to be so soft, that they might easily be cut with a knife. I did not think it prudent to leave any portion of bone that was in so diseased a state, and, in consequence of this opinion, I was under the necessity of removing the greatest part of the cuboid bone, which supports the two last toes, and to saw off also a small portion of the astragalus. This extent of disease in the metatarsus and tarsus put me under the necessity of removing all the toes, which were now rendered useless, and suggested a method of finishing the

operation which proved highly advantageous to the patient. Having dissected out the metatarsal bones, and removed the toes, by a transverse incision made at their junction with the metatarsal bones, I elevated the integuments and muscles forming the sole of the foot, and applied their extreme edge (where I had cut off the toes) to the edge of the wound made through the integuments and muscles on the upper part of the foot. The parts were retained in contact by futures. There was a considerable discharge from the wound during the first week; but a firm union afterwards took place, and a part of the foot, four inches and a half in length, remained completely covered by the natural integuments.

How far this mutilated foot was capable of performing the functions of a natural one, I cannot tell, as the poor girl was lame of that extremity from other causes.

CASE II.

In the year 1799, I had an opportunity of repeating this operation, and found it to answer perfectly my expectations.

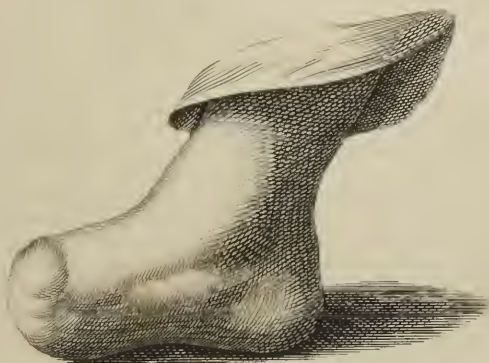
Mary Stansfield, aged eighteen years, of Holme in Lancashire, was admitted an in-patient of the General Infirmary at Leeds, under my care, on account of a caries in the metatarsal bones of one foot, upon whom I operated in the following manner :

I made a mark across the upper part of the foot, to point out as exactly as I could, the place where the metatarsal bones were joined to those of the tarsus. About half an inch from this mark, nearer the toes, I made a transverse incision through the integuments and muscles covering the metatarsal bones. From each extremity of this wound, I made an incision along the inner and outer side of the foot to the toes. I removed all the toes at their junction with the metatarsal bones, and then separated the integuments and muscles, forming the sole of the foot, from the inferior

part of the metatarsal bones, keeping the edge of my scalpel as near the bones as I could, that I might both expedite the operation, and preserve as much muscular flesh in the flap as possible. I then separated with the scalpel the four smaller metatarsal bones at their junction with the tarsus; which was easily effected, as the joints lie in a straight line across the foot. The projecting part of the first cuneiform bone, which supports the great toe, I was obliged to divide with a saw. The arteries which required a ligature being tied, I applied the flap, which had formed the sole of the foot, to the integuments which remained on the upper part, and retained them in contact by sutures. A speedy union of the parts took place, and the wound was healed, except a very small superficial sore, at the expiration of a fortnight. The foot was not so much shortened by this operation as might have been expected. For though the metatarsal bones, which had been removed, are usually about three inches in length,* yet the mutilated foot was but one inch shorter than the sound foot, measuring from the heel to the root of the little toe; the latter being eight inches, and the former seven in length.

The patient could walk with firmness and ease. She was in no danger of hurting the cicatrix, by striking the place where the toes had been against any hard substance; for this part was covered with the strong integuments, which had before constituted the sole of the foot. The cicatrix was situated upon the upper part of the foot, and had very little breadth, as the divided parts had been kept united, after being brought into close contact. The advantages of this operation will sufficiently appear upon inspecting the annexed plate, in which the mutilated foot is accurately represented from a drawing made by Mr. Russell, of the Royal Academy, who happened to be at Leeds before this patient was dismissed from the Infirmary, and who favoured me with two views of the foot, elegantly painted in crayons.

* I did not measure them in this case.



B. Tanner.

Engraved for James Humphreys

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